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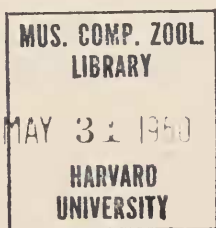
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BALTIC AMBER SPIDERS
IN THE MUSEUM OF
COMPARATIVE ZOÖLOGY

Ivanovitch
By ALEXANDER PETRUNKEVITCH

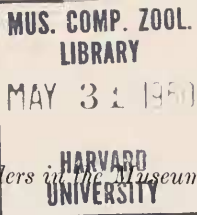
WITH TWENTY-SEVEN PLATES



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No. 5 — *Baltic Amber Spiders in the Museum of Comparative Zoölogy*¹

By ALEXANDER PETRUNKEVITCH²

The collection of Baltic Amber spiders, which forms the subject of the present contribution is interesting in several respects. While partly consisting of young spiderlings of the second or third instar the identification of which is of very doubtful value from the point of view of modern Arachnology, there still remain a number of mature individuals of both sexes, the identification of which is beyond cavil, and some submature specimens sufficiently well preserved to permit detailed description, and thus make the recognition of other specimens of amber spiders of the same species possible and, indeed, safe. Of course, such identification requires very careful study of all, even minutest characters and measurements of all parts. It also requires line drawings without which identification on the basis of a most detailed description could be regarded at best as a first approximation. But the same method of detailed description and figuring has to be accorded even fully mature specimens, if one wishes to consider them in the light of phylogenetic problems. The figuring only of the palp or of the epigynum, sufficient for the identification of the species is quite inadequate for any other purpose.

An interesting feature of the collection is the light which it sheds on the internal anatomy, regeneration, physiology etc. of spiders of the Baltic Amber period. Taken with the information contained in the numerous investigations of Recent spiders it proves that spiders of the Baltic Amber period already possessed to the minutest detail all essential features of anatomy and behavior of their now living relatives and differed from them only in specific, to a considerable extent in generic and to a much lesser one in familial characters. Thus far neither former investigators of the Baltic Amber spider fauna, nor myself found any Recent species among them. Nor are the genera which are represented in both the Baltic Amber and the Recent fauna closely related to the present European fauna. On the contrary, genera which have European species are few and are widely distributed, while those which have no European species are more numerous and have now living species in distant countries, such as South Africa, Malay peninsula, Australia, South America. Moreover, entire families not found in Europe, are represented in the Baltic Amber, namely Archaeidae and Pschridae. And while each of these

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² A Contribution from the Osborn Zoological Laboratory of Yale University.

two families is represented by a single genus, they seem to have been fairly common. In fact, the Family Archaeidae has more species in the Baltic Amber than in those foreign regions in which Archaeidae are still living. Nor can this fact be interpreted as evidence of their "primitive" or "ancestral" nature. On the contrary, they are highly specialised and were most probably handicapped in their struggle for existence by being unable to adapt themselves to new environmental conditions on account of their specialization. In that respect the name *Archaea* is truly a misnomer. Not one anatomical feature of the Baltic Amber species can be regarded as more primitive than what is found in Recent species.

The high specialization of the Baltic Amber spider fauna is also immediately apparent when one examines a palp of a mature male, such as shown in figures 56, 57, 83, and 109, drawn under fairly high magnification. The details of their structure are quite on a par with the details of corresponding structures in Recent species belonging to the same families. In many cases a figure of the palp would be sufficient for identification of the species. Unfortunately, the palp is often in a flexed condition and the structure of the copulatory apparatus is then only imperfectly visible. For some unknown reason the structure of the epigynum in female specimens is very rarely visible. In most cases the ventral surface of the entire abdomen is coated with a white emulsion impenetrable to light at least inasmuch as any detail and often even the outline of the epigynum is concerned. Nevertheless the few cases in which the epigynum is visible, as shown in figures 68, 69 and 127, make it certain that the epigynum was also as highly developed as in Recent species.

The same may be said about the spinnerets. In Recent spiders spinnerets are used at best as familial characters. This is due primarily to the difficulty of properly studying them on specimens which one does not want to destroy or to mutilate. In amber species, when visible, they furnish important additional characters for the recognition of the species. The number and disposition of the spinning tubes as shown in figures 46 to 48, and 97 and 98, should never be disregarded.

Autotomy of appendages was common in Baltic Amber spiders and the point of severance was the same as in Recent species. This is borne out by the number of individuals with one or more legs missing, the coxo-trochanterial articulation showing the healed surface. A case like the one shown in figure 204 is particularly instructive, inasmuch as the two severed legs may be seen lying in front of the spider and the ends of their coxae are clearly discernable on the left side of the carapace. It shows that the spider tried to free itself from the hold of

the sticky gum in which it was caught, by breaking off two of its legs before it was completely engulfed. On the other hand the exuvium of *Segestria elongata* shown in figure 169 suggests that regeneration was still possible in case the end of a leg was severed before the entire leg could be broken off. In the case of this particular spider the regenerated end is shown in figure 170. It consists of a single segment although there should be two segments, metatarsus and tarsus, the latter ending in claws in an uninjured specimen. The regenerated single-jointed piece lacks claws.

This exuvium, shown in figure 169, shows two other interesting features. Its foregut is complete (figure 172) and in every detail like the foregut of Recent species of the same genus. So is the structure of the edge of its sternum (figure 158 is so much like it, although made from another species, that a separate drawing seemed to be unnecessary). The eyes shown in figure 171 illustrate a case of abnormal development: the lens of the left anterior lateral eye is twice as small as the lens of the corresponding right eye.

An exuvium of *Eocryphoeca gracilipes* is preserved with the molting web in which it was left by the spider. A part of this web is shown in figure 179. But of greater interest than this web are the silk threads of *Ephalmator fossilis*, shown in figures 175 and 99 and 104. They belong to the type with viscid droplets commonly found in Recent orb webs. Bachofen-Echt figured similar silk threads in Baltic Amber in 1934, but his specimen was not accompanied by either an exuvium or an embalmed spider and the identity of the silk remained conjectural. The specimen in the collection of the Museum of Comparative Zoölogy is in every respect superior. The spider died in the process of producing silk threads and each individual thread can be traced under microscope to the corresponding spinning tube. The spider itself is so well preserved that a detailed description of it was possible and will be found below. Whether it was a maker of orb-webs or webs of a pattern different from anything known today remains of course unknown. But the appearance of the threads is similar to that with which we are familiar in the case of Recent spiders. It is interesting that so many of the droplets retained their individuality as globules instead of merging with each other. This phenomenon must be attributed to the physical properties of both the silk and the still fluid amber at the time the spider was entangled in it.

There are very few amber spiders showing color patterns except such as are due to a different degree of darkness of the chitin. The collection of the Museum of Comparative Zoölogy has one specimen, however, in which the color pattern was undoubtedly due to other pigment than the one normally responsible for the more or less rufous

color of chitin. This is *Caduceator quadrimaculatus* shown in figures 202 and 125. Here we have to do with hair which appears to be white, may have been of some other color, red or blue, which faded out with time, but which must have been different from the rufous color of most of the body surface.

Of the internal organs the muscles in the appendages are the most commonly preserved. Such a case is shown in figure 209. The individual muscles shrank and their connection with the articulation points is severed, but otherwise they are well preserved. Their number and disposition seems to be the same as in Recent spiders.

Of exceptional interest is the case of *Paruroctea blauvelti* shown in figure 186. Here not only the muscles of the appendages are at least partially preserved, but the entire abdominal visceral mass is sufficiently well preserved to show clearly the "liver" (chylenteron), the ovary and the heart. The heart is shown in figure 174. But perhaps the most interesting case is that of *Eothanatus diritatis* in which a portion of the abdominal wall is so perfectly preserved that the limits between the cells and the nucleus within each cell are clearly visible under high power (figure 176).

Of the sense organs only the eyes and the trichobothria are more or less regularly visible. The latter are difficult to photograph on account of the extreme smallness of their diameter. When, however, as in the case shown in figure 180 the entire surface of the trichobothrium is covered with little crystals, photography is comparatively simple. In this particular case the greatest difficulty was in bringing into focus the entire trichobothrium. For this purpose I had to tilt the slide under microscope until both ends of the trichobothrium appeared sharply outlined, the rest being taken care of by the stopping down of the diaphragm.

Twenty families are represented in the collection, one of them a new one — EPHALMATORIDAE, and one, Dictynidae, for the first time described from amber. *Archaea hyperoptica* Menge, *Nactodipoena infulata* (Koch and Berendt) and *Linyphia oblonga* Koch and Berendt represented each by one specimen, have been described in detail. Five new genera are proposed, EOLATHYS, EPHALMATOR, EOSTAIANUS, FIDUCIA and EOTHANATUS. One Recent genus, Harpactes, not previously known from the amber, is now recorded for the first time, represented by a single, new species. Seventeen new species are described in detail and figured.

To facilitate the use of the present paper by paleontologists who are not familiar with my papers dealing with the classification of Recent spiders I may state that the arrangement and the numbering of the families is in agreement with the one used in my Catalogue of

American Spiders. Since strictly fossil families are omitted from that Catalogue, the new fossil Family Ephalmatoridae appears here without a number.

It gives me great pleasure to express my thanks to Professor F. M. Carpenter of Harvard University for the privilege of studying this extremely interesting collection, and his patience with the slow progress of my work.

13 Family UROCTEIDAE

Genus PARUROCTEA Petrunkevitch 1942

Type *P. blauvelti* Petrunkevitch

PARUROCTEA BLAUVELTI Petrunkevitch

Figures 1-3, 174 and 186

Paruroctea blauvelti Petrunkevitch, Trans. Conn. Acad., 1942, Vol. 34, p. 193, Figures 465 to 469 and 618. Type. Cornell University. Mus. Comp. Zoöl., Harvard, Specimen 7127 (3617)

The present specimen belonging to the Mus. Comp. Zoölogy, although three times smaller than the type, belongs to the same species. It has the advantage over the type in that the sternum is completely and clearly visible and the dorsal wall of the abdomen, missing in the type, is also preserved. The specimen is only 1.1 mm. long. It is shown in Figure 186 photographically with all its legs as viewed from above. Figure 1 shows at a somewhat higher magnification the carapace and abdomen. On the carapace the eye group is visible, but the individual eyes are very difficult to see and only their outer edge shows in certain positions of the illuminating ray. There is a stout bristle between the anterior median eyes, a pair of much finer bristles are situated in front of the posterior median eyes, while behind the eye group two bristles, one behind the other, are situated in the plane of symmetry. The eye group is transversely elliptic, 0.14 mm. long, 0.21 mm. wide.

The sternum of the type was figured by me with a rounded posterior edge (1942, figure 466), but in the text I left the question open as to the true shape of its posterior edge—"the presence of an air-bubble prevents a clear view of the posterior end of the sternum, so that it is impossible to decide whether the posterior edge is rounded or ends in

a short point." (p. 194). The specimen of the Museum of Comparative Zoölogy shows the sternum clearly and its outline may be followed without difficulty under microscope. It is shown in Figure 2 at a magnification of 55 X. Its anterior edge is straight, its posterior edge is not rounded, but drawn out into a blunt point projecting between the fourth coxae. The length of the sternum is a fraction shorter than the width, the former being 0.41 mm. and the latter 0.42 mm. But since the sternum, like the rest of the spider is distorted, it is difficult to say whether in its normal condition it was as long as wide or slightly wider than long. At any rate the difference must have been very insignificant and well within the limits of possible variation.

The legs are as in the type, and such small differences as may be noticed are of no great importance. They may be attributed to the difference in the instar. The claws shown in Figure 3, as they appear on the third left leg under a magnification of X 275, are somewhat more slender than in the type, but resemble the latter in their general structure. There are no serrated bristles and no spurious claws.

The abdomen is very well preserved. It is evenly rounded at both ends and its outline is an almost perfect ellipse. (Figure 1). Its dorsal surface is clothed with curved, widely spaced, coarse hairs shown in the drawing only around the edge so as not to obstruct the view of the inner organs. The spinnerets and the anal tubercle are as in the type and characteristic of the family. The tuft or crown of long, diverging hairs at the end of the anal tubercle is plainly visible. What makes this specimen unique among Baltic Amber spiders is the preservation of the "liver" (chylenteron), ovary and heart. To be sure, the preservation is not perfect and the shrinkage of the visceral mass and its loosening from the abdominal wall caused considerable displacement from the original position of the organs. But they are plainly recognizable and look very much as in Recent spiderlings which are mounted in toto in dammar. In the chylenteron subdivisions can be seen, but their number cannot be determined. Their general appearance is coarsely granular, of a light yellowish-brown color. In the ovary about 18 immature eggs can be counted, more or less evenly separated and of much darker, reddish brown color. The heart is transparent and colorless, but its outline is quite sharp (Figures 1 and 174) and three pairs of projections can be seen, corresponding to the cardiac auricles of Recent spiders and presumably containing the ostia. The ostia, however, cannot be seen and their number may be only assumed to be three pairs by analogy with similar pictures of the heart in Recent spiders.

The specimen is undoubtedly a very young female.

17 Family ARCHAEIDAE

Genus ARCHAEA Koch and Berendt 1854

Type *A. paradoxa* Koch and Berendt

A key to the species of *Archaea* will be found in my Study of Amber Spiders, published in 1942. That key was based on characters given by Koch and supplemented by Menge, on Simon's description of his *A. pugneti* and on my own study of the female, now hypotype, in the collection of the British Museum. The collection of the Museum of Comparative Zoölogy contains two specimens of *Archaea paradoxa* and one specimen of *A. hyperoptica* of which I give here a detailed description with figures.

ARCHAEA HYPEROPTICA Menge

Figures 4-10 and 187

Archaea hyperoptica, Koch and Berendt, 1854, p. 22. Hypotype in Mus. Comp. Zoöl., specimen No. 7148 (129)

Menge did not give a figure of his species and his description is so brief that it would be almost useless were it not for the mention of the single character by which *A. hyperoptica* may be distinguished from all the other species of the genus, and which it shares only with the South African Recent *A. godfreyi* Hewitt. Following is a complete quotation of Menge's description: "Kopftheil erhöht, halbkugelförmig, hinten allmählig ohne deutlichen Absatz (was also in den Gattungsmerkmalen zu streichen wäre) in das ansteigende Rückenschild übergehend. Stirn und Gesicht ziemlich flach. Augen wenig erhöht. Hinterleib durch ein dünnes Stielchen von der Brust getrennt, eiförmig, fast kugelig, parallelfurchig und behaart. Spinnwarzen über den Afterring vorragend. Kiefer mässig lang, Füsse mit gekrümmten Härchen dicht besetzt." The absence of a break (Absatz) between the head and the thorax clearly separates *A. hyperoptica* from *A. godfreyi* to which it has the greatest affinity, for although the latter also has no neck, it shows a deep indentation separating the head from the thorax and clearly shown in Hewitt's figure. The Museum of Comparative Zoölogy has a single specimen undoubtedly devoid of all visible separation between the head and the thorax and therefore, in this respect, fully agreeing with Menge's statement. It is an immature specimen in very clear amber and complete but for the right metatarsus and tarsus of the first pair of legs. The specimen may be, therefore, regarded as a hypotype.

Description of the hypotype. (Figures 4-10 and 187). Total length without chelicerae 1.75 mm. Carapace 0.70 mm. long, 0.35 mm. wide, 0.45 mm. high, just behind the eyes, sloping gradually almost in a straight line backwards, without the slightest indication of the limits of the head. No sculpturing is visible either on the back or on the sides of the carapace, comparable to what one sees in *A. paradoxa*. The face is distinctly concave. The cheliceral foramen through which the chelicerae project, is neatly transversely elliptic. Above the chelicerae the carapace appears as a distinctly swollen ridge or transverse welt slightly wider than the anterior eyes. The eyes themselves are difficult to see. They become visible only when the background is left dark and a narrow beam of strong light directed at a certain angle penetrates below the surface of the carapace. Under these conditions measurement is impossible, but one can see that the anterior median eyes are separated from each other by something like four of their diameters and by only about their diameter from the anterior lateral eyes. The four posterior eyes are still more difficult to see. They are considerably smaller and seem to be placed in a line parallel to that of the anterior row.

The first joint of the chelicerae is 0.65 mm. long. It has a peculiar shape, slightly stouter in the middle than at both ends and bent downwards as shown in figures 8 and 187. Viewed from in front the outer edges appear fairly straight and gradually diverging, while the inner edges are more or less parallel in their basal half, only to begin suddenly diverging from here on as shown in figure 9. A row of about eleven stiff bristles can be seen on the inner edge, the first a little before the middle. The fangs are slender, curved and pointed. The maxillae (figure 7) are long, curved and converging almost to contact with each other in front of the lip which is also unusually long, extending far beyond the middle of the maxillae. In side view (figure 10) the lip presents a distinct dip near its end. The sternum is flat, much longer than wide, truncated at both ends and widest between the first and second coxae. The first pair of coxae is widest apart, the fourth pair is sub-contiguous.

Legs	Femur	Pat.+Tibia	Metatarsus	Tarsus	Total
I	1.25	1.15	0.50	0.30	3.20
II	1.10	1.05	0.50	0.30	2.95
III	0.75	0.40	0.20	0.15	1.50
IV	1.05	0.80	0.40	0.30	2.55
Leg formula	<u>1</u>	<u>2</u>	<u>4</u>	<u>3</u>	
	4.5	4.2	3.6	2.1	

There are no spines on the legs, but all joints are clothed with short, curved hair which appears to be simple under low magnification,

but is in reality finely serrated when examined under high power. The tarsi end with a very distinct onychium (figure 6) but the claws are difficult to see. In one leg only, in which only an upper claw is visible, it shows two teeth, the distal one of considerable length and easily mistaken for the end of the other upper claw. The femur and trochanter of the palpi (figure 4) have a ventral row of peculiar organs which may have been either short spines elevated on pedestals, or else sensory hairs of a different function from that of trichobothria. The latter may be seen on all metatarsi under high power, a single one a little beyond the middle of the joint.

The abdomen is 0.75 mm. long without spinnerets, 0.60 mm. high, 0.50 mm. wide. When viewed from above (figure 5) it appears to be symmetrically ellipsoidal, but when examined in side view (figure 8) shows an almost flat ventral surface and its middorsal line is evenly curved. The sides show a series of parallel corrugations which however are not deep, as in *A. paradoxa*, but so shallow that they become clearly visible only under special conditions of lighting. Then one can see that these rows of parallel corrugations occupy the entire side.

19 Family MIMETIDAE

Genus *ERO* C. L. Koch 1837

Type *E. tuberculata* (DeGeer)

Koch described two species, *E. setulosa* and *E. sphaerica*, but expressed the opinion that the latter may be the same species as the former, but of different sex. Menge added in a footnote, that Koch made a mistake in observation and that both specimens are immature males. Menge himself added the names of three species from his own collection, but never gave either a description or figures of them. They are therefore *nomina nuda*. I described two species. If Koch's statement is correct we may separate his species from mine by the relative size of the eyes.

- 1. All eyes of the same size *E. setulosa*
 AME larger than the other eyes 2
- 2. Sternum but slightly longer than wide and not very prominent. Eyes not
 conspicuously protruding beyond sides of head. Palp as figured
E. permunda
 Sternum distinctly longer than wide (5:4), very convex. Eyes strongly
 protruding. Palp as figured *E. carboncana*

ERO PERMUNDA Petrunkevitch

One badly mishandled specimen in the collection of the Museum of Comparative Zoölogy (1289). It is an immature female, which makes it interesting notwithstanding its poor condition, caused by polishing off the left side and partly filling the cavity with the polishing white powder. The sternum being only little longer than wide and not very convex, and the eyes not greatly protruding, the species seems to be recognizable notwithstanding differences in other characters which may be easily explained as of secondary sexual origin.

Total length 2.14 mm. Carapace 1.25 mm. long. Its width cannot be measured. Abdomen neatly ellipsoidal, 1.15 mm. long, overhanging the carapace.

Legs	Femur	Pat.+Tibia	Metatarsus	Tarsus	Total
I	1.65	1.70	1.25	0.85	5.45
II	1.45	1.40	0.95	0.75	4.55
III	0.90	0.90	0.55	0.45	2.80
IV	1.20	1.15	0.90	0.55	3.30
Leg formula	1	2	4	3	
	4.3	3.6	2.6	2.2	

The spines are rather difficult to describe. But the typical spines of the tibia and metatarsus of the first and second leg are well visible. On the first tibia there are only six long spines, with only two short spines between them in all intervals. On the first metatarsus only four long spines, the first immediately at the beginning of the joint, the fourth separated from the end of the metatarsus by a row of six short spines. The long spines on the second leg are not as long as those on the first.

21 Family DICTYNIDAE

Genus EOLATHYS, new

Sternum produced posteriorly. Cribellum entire. Calamistrum with a single row of curved hairs, occupying about three fifths of the segment. All femora with a middorsal spine. The fourth metatarsus with a subapical dorsal and a pair of weak subapical ventral spines. All tarsi without trichobothria. Anterior eyes all of the same size, but the median pair slightly closer together. Posterior eyes about evenly spaced in a procurved line which is longer than the first line

and the lateral eyes separated by almost their diameter. Upper claws similar, with a row of about eight or nine teeth. Third claw with a long single tooth. (Maxillae not visible). Armature of chelicerae consists of a single, small tooth on promargin near base of fang. Retromargin with several fine bristles. Type *E. succini* spec. nov.

EOLATHYS SUCCINI spec. nov.

Figures 11-18, 183 and 184

A well preserved specimen (No. 7453), almost all structures of which can be seen, provided one studies it in mineral oil and changes the position of the specimen and the angle of incident light to avoid reflections from planes of stress.

Total length 2.95 mm. Carapace 1.12 mm. long, 1.05 mm. wide between second and third coxae. The head which is clearly marked by the cephalic sulci is only 0.51 mm. wide and the lateral angle between the head and the thorax is really angular and not rounded. The shape of the carapace can be understood best from an examination of its dorsal and lateral view (figures 11 and 18). It will be seen that the highest point of the thoracic portion is as high as that of the head, so that in the line of the plane of symmetry there is no dip between the two. The posterior declivity is steep and the thoracic portion of the carapace is with a double margin along its entire edge. Since the specimen is immature, it may be that the effect is due to the presence of the newly formed carapace under the still present old one. The surface of the entire carapace is sparsely clothed with simple, short hair. The eye group seems to be as wide as the head, but it is difficult to get a view of the edge of the carapace simultaneously with the eyes. The eyes are all more or less of the same size, perhaps the eyes of the second row slightly larger. Measurements are very unsatisfactory. The AME are somewhat closer together than their diameter and are separated from the ALE by their diameter (figure 15). The second row is distinctly procurved, the eyes are equidistant and the quadrangle of medians is much wider behind than in front and a little wider than long.

The chelicerae are stout and short, with parallel outer edges. The fang is curved and slender. The promargin has a small tooth close to the base of the fang, followed by a minute granule. The retromargin has no teeth, but is provided with a scant scopula composed of a single row of a few slender bristles. The maxillae and the lip cannot be seen in any position on account of white emulsion. The sternum and the coxae are very well visible (figure 14). The sternum is almost typi-

cally heart-shaped, with a small posterior process separating the fourth coxae. The surface of the sternum is fairly flat and sparsely clothed with short, simple hair directed forward. The first coxae are wide apart.

Legs	Femur	Pat. + Tibia	Metatarsus	Tarsus	Total
I	0.80	1.00	0.60	0.40	2.80
II	0.75	0.80	0.45	0.35	2.35
III	0.70	0.65	0.45	0.35	2.15
IV	0.75	0.90	0.60	0.40	2.65
Leg formula	1	4	2	3	
	2.5	2.4	2.1	1.9	

The calamistrum is shown in figure 12. It is plainly visible, occupies the largest portion of the metatarsus and consists of a single row of curved hairs. The three distal hairs longer and farther apart than the rest, and in front of the last and longest hair there stands a stout spine. A pair of slender, ventral spines can be seen on the ventral surface of the fourth metatarsus, not far from its end. There is also a dorsal spine present in the middle of each femur, but no other spines can be seen on any leg. The upper claws are similar and pectinate in a single row with about nine slender teeth. The third claw is long and has a single long tooth (figure 13). There are no trichobothria on any tarsi and I am unable to see any either on the metatarsi or the tibiae.

The abdomen is almost perfectly ellipsoidal, 1.85 mm. long, 1.25 mm. wide, overlapping the carapace as shown in figure 11. It is clothed with short, simple hair; bristles are wanting. The spinnerets are plainly visible. The anterior pair is somewhat stouter and longer than the posterior pair (figure 17). The median pair is considerably shorter (figure 12). The cribellum is entire, trapeze-shaped, wider in front than behind. No epigynum can be seen and it is probable that the specimen is immature. The palp is of the female type. Whether a palpal claw is present or wanting cannot be ascertained. Recent species always have a claw.

EOLATHYS DEBILIS spec. nov.

Figures 19-24, and 182

Type, a mature female, 7641 b (2984) figure 182. The specimen is in almost clear amber, but with a dirty plane of cleavage passing at an angle obliquely across the back of the spider. Evidently the creature was caught in fluid resin and partly submerged. The exposed

surface was covered with dust and then a new layer of clear amber resin covered the rest of the spider. As a consequence one gets a clear picture of the major portion of the body from the underside and an equally clear picture of the smaller portion of the body from above, but in no position can the complete body be seen. Part of the ventral surface, especially the spinnerets, are poorly visible on account of a white emulsion coating them. In addition, the chitin of the thorax is preserved as such, but the chitin of the head disintegrated, leaving a crystal clear mold of the outside, the details of which, such as the eyes, are extremely difficult to see and then only in certain positions of the piece and never all eight eyes at the same time. That is the reason why it was necessary to make the picture of the eye group without the aid of a camera lucida, by changing the position of the piece many times to obtain a complete idea of the disposition of the eyes. Measurements, of course, are under the circumstances quite out of the question. The cribellum is not visible. The calamistrum is very difficult to see and is visible on both legs only in a certain position different for each of the two legs.

Total length 2.29 mm. Carapace 0.95 mm. long, 0.65 mm. wide.

Legs	Femur	Pat. +Tibia	Metatarsus	Tarsus	Total
I	0.70	0.75	0.50	0.40	2.35
II	0.55	0.60	0.45	0.30	1.90
III	0.55	0.55	0.45	0.30	1.85
IV	0.70	0.80	0.60	0.35	2.45
Leg formula	4	1	2	3	
	2.6	2.5	2.0	1.9	

The carapace is fairly high and clothed with hair directed forward. The eye group is not as wide as the head. The anterior row seems to be straight and shorter than the rather strongly procurved posterior row (figure 20). The chelicerae are parallel, stout and distinctly geniculated in front. Their anterior surface is clothed with stout, but sparse hair. The margins are oblique and one can see, by examining them through the body from behind, four small, but distinct teeth on the retromargin and a scopula of some four or five long hairs on the promargin (figure 19). The sterno-coxal region is shown in figure 24. The sternum is flat, typically heart shaped, slightly longer than wide. Posteriorly the sternum is drawn out into a distinct projection between the hind coxae. The first coxae are wide apart. The spination of the legs is the same as in the genotype, but the claws (figure 22) differ from those of the genotype. The upper claws have fewer teeth and the third claw is smooth. The calamistrum (figure 23) is very much as in the genotype but for some reason is much more difficult

to see. The spinnerets can be seen only in a side view when the strong beam of light is so directed that it penetrates the white emulsion. Then it becomes apparent that they are of the same general type as in *E. succini* and that the anterior pair are widely separated at base and inclined toward each other. The epigynum is shown in figure 21.

The two species of *Eolathys* may be recognized by the difference in their leg formula.

22 Family ERIGONIDAE

Genus *EOGONATIUM* Petrunkevitch 1942

Type *E. minutum* Petrunkevitch

EOGONATIUM SUCCINI Petrunkevitch

Eogonatum succini Petrunkevitch, 1942, p. 211, figures 289, 333 to 337 and 595.

One female, 7439. It shows clearly the elevated head. The epigynum is fully developed and of the figured type, but the tip of the scape is truncated. On the basis of this character alone it would be unreasonable to create a new species as the other characters conform with the type.

26 Family AMAUROBIIDAE

Genus *AUXIMUS* Simon 1892

Type *A. denticelis* Simon

AUXIMUS FOSSILIS spec. nov.

Figures 25-28, and 185

Type. Female. Possibly immature. No. 7030. (Figure 185.) Museum of Comparative Zoölogy. The dorsal surface of the specimen is well preserved and clearly visible, the ventral surface covered with a thick coating of white emulsion obstructing the view of the mouthparts, sternum, epigynal region and spinnerets with cribellum. The legs are all complete, the claws are visible on several tarsi. The calamistrum is in plain view on the fourth left metatarsus, when the specimen is examined from below (viewed from above the calamis-

trum is hidden under the abdomen.) The appearance of the species resembles that of *A. succini* and is easily confused with the latter. However, it is easily distinguished by the greater number of teeth on the upper claws and the relatively shorter legs (by reference to the length of the carapace). The two amber species may be therefore distinguished as follows:

a) Upper claws with a row of six teeth.

Leg formula	1	4	2	3	<i>A. succini</i> Petr.
	3.1	2.9	2.7	2.5	

b) Upper claws with a row of 11 or 12 teeth.

Leg formula	1	4	2	3	<i>A. fossilis</i> , new
	2.4	1.9	1.8	1.4	

The general appearance of the new species may be best understood from figure 25 and photograph, figure 185.

Total length ca. 6.00 mm. Carapace 2.71 mm. long, 1.43 mm. wide in front, 1.86 mm. wide in its widest place, showing that the head is unusually wide. Although generally speaking the head is high, it is on a level with the thoracic portion without any noticeable dip between the two. The highest point is more or less in a line with the first pair of coxae. The eye group is only 0.86 mm. wide, that is much narrower than the width of the head. The first row of eyes (figure 27) is shorter than the second. The AME are small and contiguous. Next in size are the PME which are separated from each other by almost two of their diameters, thus making the quadrangle of medians much wider behind than in front. The lateral eyes are much the largest. They are contiguous. The four posterior eyes are about equidistant. The clypeus is very low. The head is sparsely clothed with simple hair directed forward. The individual hairs are separated by intervals which are some five or six times greater than the thickness of a hair. The thoracic portion is free from hair, except for a pair of rows beginning at the point where the head ends, diverging and outlining the posterior declivity. Each of the two rows is composed of only about half a dozen short hairs.

Legs	Femur	Pat.+Tibia	Metatarsus	Tarsus	Total
I	2.00	2.25	1.35	0.90	6.50
II	1.50	1.65	1.10	0.70	4.95
III	1.30	1.40	0.65	0.60	3.95
IV	1.55	1.60	1.30	0.70	5.15

The calamistrum (figure 26) consists of a single row of curved hairs. It begins about one sixth of the total length of the metatarsus from

the proximal end and ends about two sixths before its distal end. In other words the calamistrum is only half as long as the metatarsus.

The spines are short, but can be seen plainly where the white emulsion does not obstruct their view. There is a dorsal spine present on the first and second femur approximately in its middle. No corresponding spine seems to be present on either the third or the fourth femur. A prolateral and a retrolateral spine is present on the first and second patella, but only a retrolateral spine on the third and fourth patella. On the first tibia one can see 1-1-1 prolateral spines and 0-0-1 retrolateral. On the second tibia 1-1-1 prolateral and 1-1-1 retrolateral spines. Whether ventral spines are present cannot be ascertained. On the metatarsus one can see 2-2-2 ventral and 1-0-1 prolateral spines.

The claws are plainly visible on the first left leg and can be studied under high power from both sides of the slide. The upper claws are similar (figure 28) evenly curved and provided with a row of 12 teeth. The third claw is also evenly curved and has two small teeth.

The abdomen is 3.29 mm. long, 2.71 mm. wide, evenly rounded at both ends, somewhat flattened above. While its shape is well preserved, nothing else can be seen and even the hair, if any is present, cannot be made out. The hair on the legs, on the other hand is plainly visible through the emulsion and is short and stout, giving it a spinose appearance.

Paratype. 7648. Probably immature female. Ventral surface heavily coated with white emulsion. First pair of legs cut off. Total length 5.15 mm. Carapace 2.15 mm. long, 1.50 mm. wide. In front of the small anterior median eyes there is a bristle. The clypeus is higher than the diameter of the AME and about as high as the diameter of the ALE. The shape and appearance of the carapace is the same as in the type. It is very dark brown, the hair on it is long, curved and directed forward. The chelicerae are powerful, hirsute and provided with a prominent boss. The fangs are covered by white emulsion. The sternum can be seen, but its outline is not visible. Its surface is flat and clothed with long hairs, directed forward and at a considerable angle to the surface. The spines on the legs are much better visible than in the type and some of them stand almost at right angles, especially the ventral ones on the tibiae. The spination seems to be the same on all legs, namely: femur dorsal 0-1-2; patella prolateral 1, retrolateral 1; tibia prolateral 1-1, retrolateral 1-1, ventral 1r-1r-2; metatarsus prolateral 1-2, retrolateral 1-2, ventral 1r-1r-2 (the six distal spines forming an apical verticillum). The calamistrum can be seen on both legs and is of the same appearance as in type. The claws also conform with the type. The ventral surface of the

abdomen is heavily coated with white emulsion, precluding a view of the spinning group.

A third specimen (7176) is still smaller and must be therefore regarded as an earlier instar. It is only 3.9 mm. long. The cribellum is not visible. The calamistrum can be seen, although not as well preserved as in the other two specimens.

27 Family PSECHRIDAE

Genus EOMATACHIA Petrunkevitch 1942

Type *E. latifrons* Petrunkevitch

EOMATACHIA LATIFRONS Petrunkevitch

A single specimen (7223) which is a mature male, rather poorly preserved. Neither the calamistrum nor the cribellum can be seen, the former because of the position of the fourth legs, the latter because of white emulsion obstructing its view. But both palpi show the characteristic tibial apophyses and the identification of the species is beyond any doubt.

28 Family AGALENIDAE

Subfamily AGALENINAE

Genus EOCRYPHOECA Petrunkevitch 1946

Type, *Tegenaria gracilipes* Koch and Berendt

The Genus Eocryphoea was erected by me in 1946 for a Baltic amber spider which I referred to Koch's species *gracilipes* and which I declared to be the hypotype and the genotype. The genus is closely related to the Recent genus *Cryphoea* from which it differs by relatively longer legs, somewhat different disposition of spines and lesser disparity in the size of the eyes of the anterior row. In the same paper I referred to the Genus Eocryphoea a species which I described in 1942 under the generic name of *Myro*, namely *M. fossilis*. The genus *Myro* belongs to the Subfamily Cybaeinae which Simon erected for the inclusion of Agalenidae with spinnerets resembling those of Clubionidae. However, the shape of the spinnerets is not always easily recognizable in amber spiders. Taking the combination of all

characters under consideration the two above species seem to be congeneric. Now a third species described below must be added, since it agrees with them in several important characters. The three species may be distinguished one from another as follows:

1. Anterior median eyes distinctly smaller than the lateral eyes. 2
- Anterior median eyes of the same size with the other eyes. Eyes of first row contiguous. *E. distincta*, n. sp.
2. Quadrangle of median eyes almost twice as wide behind as in front. Eyes of second row separated by slightly less than their radius. Posterior median eyes as large as posterior lateral eyes.
E. gracilipes (Koch and Berendt)
- Quadrangle only a little wider behind than in front. Eyes of second row separated by about their diameter. Posterior median eyes distinctly smaller than posterior lateral eyes. *E. fossilis* (Petrunkevitch)

An additional interesting character of the new species is the lack of plumose hair so characteristic of all Recent Agalenidae.

EOCRYPHOECA GRACILIPES (Koch and Berendt)

Tegenaria gracilipes Koch and Berendt, 1854, p. 47, pl. xvi, fig. 139.

Eocryphoea gracilipes, Petrunkevitch, Amer. Mus. Novit., No. 1328, 1946, p. 4, figs. 11-21, 78.

The Museum of Comparative Zoölogy has a specimen No. 6803 which I refer without hesitation to this species. It is an exuvium, but one in excellent preservation permitting the recognition of all important characters. What is of great interest, however, is the fact that the exuvium is preserved with its web in which it must have been suspended by the spider as usual to make molting easier. It seems quite certain that the web belongs to this individual spider, for there are no signs of distortion or damage to the web. Presumably it was attached to some dead plant, a portion of which bearing the web was then dropped from above or blown by the wind against a drop of fluid resin and thus preserved in its normal shape. Most of the hypothetical plant must have been cut or broken off long before the piece was purchased by the Museum, but a small triangular piece which may be a piece of a leaf is still remaining in the amber. The silk is of the simple variety, not viscid, some threads are quite thin, others are held together forming fairly stout cables. The web lies in two planes intersecting each other at almost right angles, but in the preparation of the photograph shown in figure 179 only one plane was brought into focus and the objective (Apochromat 16) was purposely

used at its maximum numerical aperture. This gives a better idea of the actual structure of the web in one of its planes. It is very different from that of Recent Agalenidae of the genera *Agalena* and *Tegenaria*. Unfortunately at this moment I do not have a sample of a web of a Recent *Cryphoea* and can find no figure of it for comparison.

EOCRYPHOECA DISTINCTA spec. nov.

Figures 40-49 and 198

Type, No. 7751. A mature female, a well preserved specimen which, however, shows some peculiarities. The tips of three legs are missing, the end of one palp is broken off and shifted a little forward in the amber, the sternum is also missing and its place is filled with white emulsion, and several portions of the chitinous skeleton seem to be carbonized. It gives the impression as if the specimen was dead when it was caught in the resin and remained partially exposed to the air before being completely engulfed. Nevertheless the preservation is excellent and some structures can be seen which were less distinct in the types of *E. fossilis* and *E. gracilipes*.

Total length 4.2 mm. Carapace 1.85 mm. long, 1.40 mm. wide between second and third coxae. Head with parallel sides, 0.82 mm. wide. Eye group 0.57 mm. wide, with second row of eyes slightly wider than the first row. The carapace is flat, with head and thorax on the same level and posterior declivity gentle. Thoracic groove longitudinal. Cephalothoracic sulci clearly visible (figure 40). The carapace is very sparsely clothed with simple hair. The eye group (figure 41) is difficult to study on account of the black color of the carapace and eyes. The first row is well visible from above and shows clearly that all its eyes are contiguous and of about the same size. The eyes of the second row are also of about the same size, though it is possible that the posterior lateral eyes are just a little larger than the posterior median eyes which are very difficult to see and to measure. The quadrangle is a little wider behind than in front and a little wider than long in the same ratio of 25 : 22. Looked at from above the posterior row is so slightly procurved that it may be said to be straight. Looked at from in front the anterior row is very little downcurved and the clypeus is ca. as high as the diameter of the eyes.

The chelicerae are short and not geniculated. They are altogether invisible from above, nor can they be studied from below on account of dirt in the amber, which hides also the maxillae and lip. The sternum is missing as stated above. The fourth left coxa is broken across and its mesial end is missing.

Legs	Femur	Pat.+Tibia	Metatarsus	Tarsus	Total
I	1.70	2.10	1.45	1.00	6.25
II	1.55	1.75	1.35	0.85	5.50
III	1.40	1.65	1.35	0.50	4.90
IV	1.70	1.70	2.00	0.60	6.00
Palp	0.75	0.62		0.67	2.04
Leg formula	1	4	2	3	
	3.4	3.2	3.0	2.6	

The general proportion of the legs may be seen in the photograph (figure 198), but to make it still easier to appreciate, figure 40 was drawn to scale with all legs arranged in the conventional manner. The legs are distinctly spinose and the spines are long and stout. Figure 45 gives an idea of their appearance compared with the segment—in this case the metatarsus—to which they belong. The arrangement of the spines is as follows. First leg, femur dorsal 1-1-1, prolateral 0-1-1, retrolateral 0-0-1. Patella dorsal 1-1. Tibia ventral 2-2-0, metatarsus ventral 2-2-2. No other spines. Second leg same as first. Third leg cannot be studied satisfactorily. Fourth leg, femur dorsal 1-1-2, patella dorsal 1-1 bristles, retrolateral 1-1 (the first a spine, the second a bristle). Tibia dorsal 1-1, prolateral 1-1, retrolateral 1-1, ventral 2-2-2. Metatarsus dorsal 1-1-1, prolateral 1-1-1, retrolateral 1-1-1, ventral 2-2-2. The upper claws are similar, with a row of 10 or 11 teeth, the third claw with 2 or 3 teeth (figure 43). There are no serrated bristles, no plumose hair on the legs. The trichobothria are long and fine, especially on the metatarsi (figure 44). On the tarsi they increase in length distally and are in a single row.

The abdomen, heavily coated above with white emulsion, is 2.5 mm. long, 1.85 mm. wide in its posterior third as shown in figure 40. Anteriorly it overlaps the posterior edge of the carapace. Its dorsal surface is sparsely clothed with long, stout, dark hairs protruding through the emulsion. The ventral surface is sparsely clothed with much shorter hair which is so stout that in places it has the appearance of rods. Both surfaces of the abdomen are flat. The spinnerets are plainly visible and are shown in figure 42. The anterior pair are cylindrical with a very short second joint. At base they are separated by more than their width. The median pair are small, single-jointed and very hairy in appearance. They are separated by almost their width. The posterior pair are much more slender than the anterior pair and their first joint is as long as the entire anterior spinneret. Their second joint is cone-shaped and considerably shorter than the first joint. They are wider apart than the anterior pair and the four spinnerets form therefore with their bases a trapeze which is wider behind than in front.

The spinning tubes can be seen in strong light, but naturally only

those which are visible from below. There seem to be four types of them. On the anterior spinnerets (figure 48) the spinning tubes are short and have short ends. On the median spinnerets (figure 47) one can see four tubes with long, cylindrical base and relatively short end, and two very large cone-shaped spigots. On the posterior spinnerets (figure 46) one cone-shaped spigot may be seen at the very end of the second joint, and four small tubes with long ends. The epigynum itself cannot be seen on account of some obstruction in that region. But in front of the genital fold a flat, more or less diamond-shaped (figure 49) swelling is plainly visible, corresponding to a similar swelling in Recent mature females.

Subfamily CYBAEINAE

Genus MYRO Cambridge 1876

Type *M. kerguelenensis* Cambridge

MYRO HIRSUTUS Petrunkevitch

Figures 29-39, and 197

Myro hirsutus Petrunkevitch, 1942, p. 231, figs. 308-311, and 601.

This species was described by me on the basis of a very poorly preserved specimen contained in a piece of imperfect and very dark amber. Many important characters could not be seen in the type, still less could they be drawn with the aid of a camera lucida even when discernible in a beam of strong light. For this reason it seems advisable to give here a detailed description and a number of drawings of different structures visible in the specimen belonging to the Museum of Comparative Zoölogy because of its excellent preservation in almost perfectly clear amber.

Mature male (figures 29-39, and 197). Total length with chelicerae 4.6 mm. General appearance best understood from an examination of figure 197 which is a photograph made on a panchromatic plate with a light red ray filter. Many parts of the specimen are almost pitch black. A bubble of air is enclosed in the abdomen and had to be left there since nothing but drilling would have made its removal possible. This was unnecessary, because the bubble did not obstruct the view of any important character. The legs are so flexed that only the anterior quarter of the carapace is visible and a drawing of the entire carapace is impossible except as a restoration on the basis of

measurements and of examination of the specimen in different positions. One can see the left edge as a line interrupted by the femora, when one inclines the specimen so that its left side is distinctly raised. Similarly one can see the right edge of the carapace by turning the specimen on its back. A short piece of the posterior edge just across the petiolus can be seen from above, permitting exact measurement of the length of the carapace. The eye group is elevated above the sides of the head, but the elevation cannot be called a tubercle, because it extends apparently to the end of the head, gradually descending to the level of the carapace at the point where the head ends and the thoracic portion begins. The carapace is 1.85 mm. long, ca. 1.1 mm. wide between second and third coxae (exact measurement impossible), 0.90 mm. wide in front view of the face. The eye group is only 0.40 mm. wide, i.e. less than half the width of the head. Viewed from above (figure 30 and 32) the first row of eyes is almost straight, the second row strongly procurved. The quadrangle of medians is 0.24 mm. long, 0.12 mm. wide in front, 0.17 mm. wide behind, i.e. it is considerably longer than wide and much narrower in front than behind. The anterior median eyes are the smallest and have a diameter of 0.06 mm. Next come the posterior median eyes with a diameter of 0.07 mm. The lateral eyes are equal and continuous, with a diameter of 0.09 mm. A very stout and long bristle stands in front of the median eyes as shown in figure 31. (In figure 32 only the base of the bristle is shown, because the bristle is much longer than the quadrangle.) Viewed from in front, the first row of eyes is distinctly downcurved. The clypeus, measured from the anterior edge of the carapace to the anterior (lower) edge of the AME is 0.12 mm. high, but if measured only to the edge of the ocular elevation is 0.07 mm. The surface of the carapace is clothed quite sparsely with fairly long and stout hair.

The chelicerae are black, stout, somewhat bulging in front, with more or less parallel sides and transverse margins. The armature of the latter is not visible. The fang seems to be little curved and rather short. A boss is wanting. The front surface of the chelicerae is covered with long, stout, dark brown, curved hairs.

The sterno-coxal region is plainly visible (figure 29). The lip is flat, black, evenly rounded on the sides and in front, transversely truncated behind. Its width at base is exactly the same as that of the sternum, so that the outline of the latter is in direct continuation with the edge of the lip, together forming a neat, elongated oval. Measured alone, as is customary in arachnology, the sternum still is considerably longer than wide, being 0.9 mm. long and 0.7 mm. wide. It is quite convex in a transverse section and becomes convex in a longitudinal section as it reaches the second pair of coxae. From here

on backwards it also shows a series of slight, transverse corrugations. Its color is dark reddish brown and its surface is very sparsely clothed with long hair. The first pair of coxae is wide apart, the fourth pair contiguous and larger than the others. The lip is black and much wider than long, but the exact measurement of its length is difficult on account of dirt at its end. The maxillae are also black and quite peculiar in shape (figure 29). They converge over the lip and are separated in front only by a thick, brown scopula. Anteriorly the maxillae form an almost transverse line with a rounded external angle. The insertion of the trochanter is indicated by short black lines in the drawing.

Legs	Femur	Pat.+Tibia	Metatarsus	Tarsus	Total
I	1.15	1.25	0.85	0.60	3.85
II	0.95	1.10	0.85	0.55	3.45
III	0.90	0.90	0.75	0.45	3.00
IV	1.15	1.50	0.90	0.50	4.05
Leg formula	4	1	2	3	
	2.1	2.0	1.8	1.6	

These measurements are probably more exact than those I gave for the type, because of the peculiar shape of the piece in which the latter is enclosed, and considering the difficulty of exact measurements under those conditions on account of the relatively great refractive index of amber. But the general agreement is remarkable. The spines are well visible, short, but elevated, giving the legs a rather spiny appearance, although they are numerous only on the last two pairs. First and second leg, tibia dorsal 1-0-1 bristles, ventral 0-1r-1r (the first a bristle, the second a spine). Metatarsus 2-0-2 ventral spines. No other spines on these legs. Third leg patella retrolateral 1, tibia dorsal 1-0-0, prolateral 0-1-1, retrolateral 0-1-1, ventral 0-2-2. Metatarsus retrolateral 1-1-1, ventral 0-2-2. Tarsus ventral 1-1 small spines in midventral line. No other spines on third leg. Fourth leg same as third except tibia dorsal 0-1-0. The presence of two small spines on the third and fourth tarsi is a very unusual character. These spines, however, are no longer than the hair, but being stouter, may be recognized in side view. All legs are rather hairy. The hair is simple. Plumose hair and serrated bristles are wanting. One can see on the first metatarsus 1-1-2 trichobothria and on the first tarsus 2-1 trichobothria. The same appear also on the fourth leg, but the position of the other legs makes their examination for trichobothria uncertain. The third claw is of the same type on all legs, comparatively small, smooth and curved. The upper claws (figures 36-39) show a progressive diminution in the number of teeth from the first leg to

the fourth and a distinct dissimilarity between the pro- and the retro-claw, the former with a greater number of teeth at least on the second and third leg where they can be counted. The first proclaw has about 19 fine teeth, the second proclaw also about 19 fine teeth, while the retroclaw has much stouter and fewer teeth. The third proclaw has 12 teeth, the retroclaw only seven. The upper claws of the fourth leg are similar, each with only six stout teeth. The figures of the claws have been all made at the same magnification and thus give also a good idea of their relative size.

The abdomen is ellipsoidal, 2.4 mm. long, 1.4 mm. wide. It leaves the pedicel clearly visible. The spinnerets are shown in figure 33. They are very difficult to see on account of a film covering them and can be made out only in three quarter view, which makes the anterior pair appear contiguous without a possibility to decide whether that is their actual position or only an effect of examination under an inclined angle of view. One thing is quite certain, namely that they are cylindrical. It seems also to be certain that a colulus is wanting. The surface of the abdomen is clothed with long, standing out hair giving it the hirsute appearance. All hair is simple.

Both palpi are well visible, but quite black. This makes their study very difficult. The retrolateral tibial apophysis is very characteristic and quite blunt and flat, but can be seen only in a position when it does not overlap the surface of the cymbium (figure 35). When the palp is viewed from such an angle that the tibial apophysis comes to lie above the surface of the cymbium, the outline of the apophysis is quite invisible because of the black color of both. The structure of the copulatory apparatus is almost impossible to see for the same reason. It is shown in figure 34 as far as I was able to do it. It certainly is more complex than the figure shows. The cymbium is covered with stout, curved hairs.

The entire specimen is criss-crossed in several directions by threads of silk. No silk is connected with the spinnerets and this makes the assumption that the silk was produced by the specimen in question not quite certain. It is possible that it was already in the resin when the spider was also entangled in it, but the chances are at least equal in the case of either assumption. The threads are composed of several finer ones stuck together, and are of the simple, drag-line type.

29 Family PISAURIDAE

Subfamily THAUMASIINAE

Genus *ESURITOR* Petrunkevitch 1942Type *E. spinipes* Petrunkevitch

This genus was proposed by me for a peculiar spider found in Baltic amber and distinct from Recent species of the same subfamily by the unusual length of its ventral spines on the tibia and metatarsus of the first pair of legs and still more so on the second pair. In this respect *Esuritor* resembles spiders of the sparassid Subfamily Sparianthidinae, but whereas the latter have only two claws and claw tufts, *Esuritor* has three claws and no claw tufts.

ESURITOR SPINIPES Petrunkevitch

Esuritor spinipes Petrunkevitch, 1942, p. 235, figs. 69-72, 534-535.

The type of this species is in the collection of the British Museum and is an immature female; the paratype is a still younger specimen. Specimen No. 9741 in the collection of the Museum of Comparative Zoölogy is a little smaller than the type. It is 4.7 mm. long. Its carapace is 2.14 mm. long, 1.57 mm. wide, the abdomen 2.57 mm. long, 1.29 mm. wide. Unfortunately the specimen was badly mishandled. All four legs of the left side were polished off and the tip of the right fourth leg is also missing. In addition, part of the head was also polished off leaving only a portion of the eye group intact. The specimen is immature, but there is no doubt of its specific affiliation because all important characters are present and conform with the type.

34 Family THERIDIIDAE

Subfamily LATRODECTINAE

Genus *EODIPOENA* Petrunkevitch 1942Type *E. oculata* Petrunkevitch*EODIPOENA OCVLATA* Petrunkevitch

Eodipoena oculata Petrunkevitch, 1942, p. 272, figs. 160-168, and 565; *idem*, 1946, p. 9, figs. 33, 34.

One female, 6899 (548) conforming with every character of the type. The epigynum is covered with white emulsion, but in strong light the outline of it becomes visible.

Genus NACTODIPOENA Petrunkevitch 1942

Type *N. dunbari* Petrunkevitch

The specimen which is placed here in the genus *Nactodipoena* as the hypotype of Koch and Berendt's *Micriphantes infulatus* has many resemblances with the genotype as well as with the description and figure of the type of *M. infulatus*. When the carapace is examined from above in the position in which the specimen is in the amber, it looks somewhat like Koch's figure. When the specimen is examined from the dorsal surface with the light so arranged that the lateral edge of the carapace becomes clearly outlined, it resembles the genotype. It resembles the latter also in side view. It is of course impossible to refer the specimen in question with certainty to Koch's species without reexamination of its type. It seems, however, more or less certain that the type specimen perished during the war. Under the circumstances the hypotype should be regarded as the type of this interesting little species.

NACTODIPOENA INFULATA (Koch and Berendt)

Hypotype, figures 51-54, 189 and 190

Micriphantes infulata Koch and Berendt, 1854, p. 40, fig. 29.

The specimen is a mature male, but its palpi and legs are so flexed that some of the important characters cannot be seen. Moreover, it was mishandled before it was placed in my hands for study and the amber itself is far from being free of imperfections. Nevertheless, as the accompanying photographs and figures show, there can be no doubt of its proper generic affiliation.

Total length in the position in which it appears when examined from above 1.7 mm. The abdomen is in good shape but twisted at a considerable angle out of its normal position. It is much larger than the carapace, ellipsoidal. Its greatest length is 1.25 mm. Its width 0.95 mm. and the length of the short, vertical axis of the ellipsoid, which may be regarded as the height of the abdomen 0.90 mm. The carapace (figure 53) is also preserved without any distortion to speak of. Its length from the vertex of the anterior median eyes to the posterior edge is 0.75 mm. The maximum width is 0.65 mm. and the

maximum height in the region of the posterior median eyes 0.50 mm. The height of the thoracic portion in the short region preceding its almost vertical declivity is 0.35 mm., i.e. the head is distinctly elevated above the thorax. Along the sides of the head the thoracic portion runs for a while level, only to dip suddenly anteriorly at a very steep angle as shown in figure 51. The eye group projects distinctly beyond the clypeus, the entire configuration of the carapace giving it a very peculiar appearance. The eye group itself is very difficult to study, but with patience and proper lighting all eyes can be seen and measured. They are shown in figure 54. The diameter of the anterior median eyes is 0.12 mm., that of the posterior median eyes 0.05 mm., and the lateral eyes appear to be only slightly, if at all larger than the posterior median ones. The quadrangle is 0.25 mm. wide in front, 0.16 mm. wide behind and 0.16 mm. long, i.e. it is much wider in front than behind and much wider than long. The lateral eyes are contiguous. The width of the eye group is 0.44 mm.

Legs	Femur	Pat. +Tibia	Metatarsus	Tarsus	Total
I	0.75	0.77	0.45	0.30	2.27
II	0.62	0.45	0.30	0.25	1.62
III	0.47	0.40	0.25	0.22	1.34
IV	0.75	0.75	0.45	0.30	2.25
Leg formula	1	4	2	3	
	3.0	3.0	2.1	1.8	

There are no true spines on the legs, but on the tibia of all legs are 1-1 dorsal, stiff, straight and fine bristles. The first of them is about one fifth from the base, the second about three quarters from the base of the joint. The structure of the claws cannot be seen, nor is it possible to see the fourth tarsi in a position which would show the comb. Of interest is the crest on the first metatarsus (figure 52) consisting of long and stout hairs or bristles forming a mid dorsal row and continuing in the same way to the end of the tarsus while decreasing at the same time in length. On the midventral line of the first tarsus there is also a row of stout, but short hairs. The rest of these joints, like the other joints of all legs is clothed with short, simple hair.

The sternum can be seen best in profile and appears then to be very convex. The first coxae are far apart, the fourth coxae close together. Both palpi are in plain view, but so flexed that their structure cannot be seen. The spinnerets are also visible, but not well enough for a drawing.

Subfamily THERIDIINAE

Genus FLEGIA Koch and Berendt 1854

Type *F. longimana* K. and B.

FLEGIA LONGIMANA K. and B.

Figure 55

This species, first described by Koch and Berendt and then by myself in 1946, can be separated from *F. succini* Petrunkevitch (1942) by the following characters:

- a) Order of legs 1243. Sternum slightly convex, little longer than wide, bluntly pointed behind. Carapace somewhat longer than wide (1.5 by 1.2). *F. succini*
- b) Order of legs 1423. Sternum very convex, distinctly longer than wide, prolonged and slightly bifid at posterior end. Carapace as wide as long. *F. longimana*

The Museum of Comparative Zoölogy has two specimens, belonging to the species *F. longimana*. Specimen 7183 is a damaged one, but the carapace shows the eye tubercle plainly, and both palpi are visible. It is a mature male. Specimen 7225 has several of its legs damaged by careless polishing on the part of a previous owner, but the carapace, both palpi and the abdomen are complete. It lies in almost perfectly clear amber. Since it was impossible to give a good figure of the sideview of the specimen belonging to the American Museum, and since this specimen shows it particularly well I have drawn it, omitting all other features and representing only the carapace and the left palp. The specimen was purposely tipped slightly out of absolute profile, to show more clearly the dip between the left and right cheeks of the thorax (figure 55). The relative length of the palpal femur is also best appreciated in this position.

36 Family LINYPHIIDAE

Genus LINYPHIA Latreille 1804

Type *L. triangularis* (Clerck)

LINYPHIA OBLONGA Koch and Berendt 1854

Figures 50 and 188

Koch and Berendt mention two mature males, and state that except for the palpi which are those of mature individuals but are thickly covered with emulsion (Schimmel), the rest of the structures are clearly visible. I refer to this species specimen No. 8519 (figure 188) which is a mature male, because of its general resemblance to Koch's figure although I doubt very much that it really belongs to the Genus *Linyphia*. Unfortunately the specimen is poorly preserved and the structure of the palpi cannot be seen, so that the only statement that one can make concerning them is that they are undoubtedly of a sexually mature individual, that their femur is comparatively short and straight, their patella and tibia small and of about equal size and the cymbium distinctly larger, but not conspicuous. The specimen has a total length of 2.57 mm. and its abdomen is 1.75 mm. long and 1.25 mm. wide. But the length of the carapace cannot be measured because the cephalothorax is bent upward, out of its normal position. Nor can its width be measured. The head is elevated above the thorax and the legs which are all complete, are flexed as one can see in the photograph. They are clothed with hair and there seem to be only two fine spines present on each leg, both dorsal in position and one of them at the end of the patella, the other on the tibia about three quarters from its base. There certainly is no tarsal comb present on the fourth tarsi, nor any calamistrum on the fourth metatarsi, so that the familial affiliation is certain. The abdomen resembles that of Recent *Linyphias*. Of the spinnerets only the anterior pair is visible. The legs can be measured exactly, but since the length of the carapace cannot be measured, only the order of the legs, 1243, can be given. The legs have a slender appearance.

Legs	Femur	Pat. +Tibia	Metatarsus	Tarsus	Total
I	3.14	3.14	3.29	1.43	11.00
II	2.30	2.30	2.40	1.10	8.10
III	1.15	1.15	1.00	0.85	4.15
IV	2.05	1.90	2.00	0.85	6.80

The eyes are shown in figure 50. The eye group is considerably narrower than the head. The pair of anterior median eyes are elevated

on a transversely ellipsoidal tubercle. The lateral eyes are also elevated on a common tubercle on each side, but the posterior median eyes are sessile. The quadrangle is very slightly narrower in front than behind and as long as wide. The clypeus is as high as one half the length of the quadrangle. Viewed from in front as shown in the figure the anterior row of eyes is recurved, the posterior row procurved and the clypeus is steeply inclined forward, so that the anterior median eyes look almost straight ahead.

37 Family ARGIOPIDAE

Subfamily ARANEINAE (= EPEIRINAE)

Genus *EUSTALOIDES* Petrunkevitch 1942

Type *E. setosus* Petrunkevitch

The specific and in some cases even the generic characters of Recent spiders are not always applicable to both sexes, at least in the present state of our knowledge. It is not uncommon that generic characters are based on peculiarities in the structure of the female epigynum or the male palp, or even on secondary sexual characters such as the shape of the head. Specific characters are almost entirely in this category. When it will be remembered that in several cases of Recent spiders males and females were assigned to the same species, only to discover later that they belong to different species, it will be realized how difficult it is to place a fossil spider in any species of the opposite sex. In the case of *Eustaloides* the generic characters apply to both sexes, but the specific characters applicable to the males are insufficient for the distinction of females of which we have a single species and that represented by only two specimens. The three species represented by males can be distinguished by the structure of their palpi. However, in fossil spiders it is not nearly as simple to compare the palp of one specimen with the palp of another, because one cannot handle the specimen in the manner in which one handles Recent ones and has to depend entirely upon structures which can be seen. Even then it is not always simple to understand the picture of such a complicated organ as the palp when it happens to be viewed at an angle different from that at which it was figured for the type. For this reason I am giving here new figures for each of the two species previously described by me and corresponding figures for the new species for the purpose of making comparisons between them simpler and easier to under-

stand. The terminology of palpal structures, used here, is that proposed by Comstock in 1910. While far from satisfactory for lack of comprehensive embryological evidence, it still is helpful in making comparison of certain structures possible even though their function remains unknown.

The three species may be distinguished on the basis of these structures as follows:

1. Terminal apophysis curved and large. Paracymbium without a heel, i.e. not boot-shaped. 2
- Terminal apophysis bilobed. Paracymbium boot-shaped, with a distinct, high heel. *E. calceatus*, n. sp.
2. Median apophysis large, pointed, protruding at right angles to the longitudinal axis of the palp. Subterminal apophyses seemingly wanting. *E. succini*
- Median apophysis wanting. Median subterminal and lateral subterminal apophyses well developed. *E. setosus*

EUSTALOIDES SETOSUS Petrunkevitch

Figures 80-82, and 194

Eustaloides setosus Petrunkevitch, 1942, p. 318, figs. 279-288, and 590; *idem*, 1946, figs. 42-43.

Specimen No. 7445, figure 80-82, which belongs to this species is a mature male. Its left side is completely entangled in some threads of vegetation, which are besides held together by a heavy coating of white emulsion. The best view of the specimen is presented by its right side, but even so the abdomen can hardly be seen through a layer of imperfect amber. The total length of the specimen is about 3.5 mm. The carapace is 1.9 mm. long, but its width cannot be measured because of the shape of the piece given it presumably by some jeweller. The legs can be measured very exactly without much trouble and these measurements prove that this specimen has relatively somewhat longer and thinner legs than the type. The difference is greater than what one would expect in a case of normal variation, but the difference may be accounted for by the distortion of the carapace.

Legs	Femur	Pat.+Tibia	Metatarsus	Tarsus	Total
I	2.25	2.80	2.45	0.85	8.35
II	1.95	2.15	1.85	0.70	6.65
III	1.50	1.30	1.10	0.45	4.35
IV	1.70	1.70	1.25	0.50	5.15
Leg formula	1	2	4	3	
	4.4	3.5	2.7	2.3	

The palpi are shown in figures 80-82. The paracymbium is difficult to see on account of its position and black color, difficult to differentiate from the black color of the apophyses serving as background. The terminal apophysis is shown in two views and it will be at once noticed by comparison of figure 81 with figure 282 of the type, published by me in 1942, that it has the same structure. The median and lateral subterminal apophyses shown in figure 80 may be seen only in the left palp, but are here plainly visible.

I refer to this species also specimen 8213 which is an immature male in the penultimate instar. If a greater number of mature and immature specimens were available the identification could be better verified. At present the general appearance rather than anything else has decided me in favor of this assumption. The total length of the specimen is ca. 3.9 mm. The carapace is 1.90 mm. long, 1.40 mm. wide, i.e. rather unusually narrow. However, it is distinctly distorted, the left side being narrower than the right side. If a corresponding correction of measurement is made the width is to be placed at 1.50 mm. The width of the carapace of specimen 7445 cannot be measured, but for the carapace of the type I gave the figures of 2.2 by 1.8 mm. This shows fairly good agreement.

Legs	Femur	Pat. + Tibia	Metatarsus	Tarsus	Total
I	2.10	2.50	3.00	0.75	7.35
II	1.75	1.85	1.35	0.65	5.60
III	1.20	1.10	0.85	0.40	3.55
IV	1.60	1.35	1.25	0.50	4.70
Leg formula	1	2	4	3	
	3.8	3.5	2.5	1.8	

The specimen is well preserved in clear amber. Only the first left leg is missing and there is white emulsion on the ventral surface around the mouthparts.

Specimen No. 7953, a male also belonging to this species, is shown photographically in figure 194.

EUSTALOIDES SUCCINI Petrunkevitch 1942

Figures 56-65, and 191

This species is represented in the collection of the Museum of Comparative Zoölogy by two specimens, both mature males, one of them so perfectly preserved that it adds considerably to our knowledge of the species as described in 1942 on the basis of a single specimen.

For this reason a detailed description with several figures and a photograph of the specimen (No. 8219) are given here.

Total length 3.85 mm. The appearance and general proportions of the specimen are best understood from an examination of the photograph (figure 191) and of the drawings showing the dorsal view of the body corrected for symmetry and the first and third legs drawn to the same scale with the body (figures 63-65). The carapace is 1.60 mm. long, 1.45 mm. wide between second and third coxae, strongly narrowed in front, with the anterior median eyes projecting beyond the anterior edge. The surface of the carapace is glabrous, devoid of pubescence except for a very few hairs in the region of the eye group. The color is dark red-brown, coppery. The thoracic groove is longitudinal, and the cephalothoracic sulci are fairly visible. The eye group composed of eight eyes is 0.60 mm. wide (figure 59). The ratio of the eyes is AME : ALE : PME : PLE = 9 : 6 : 6 : 6. The eyes of the posterior row are about equidistant, separated from each other by their diameter. The lateral eyes are contiguous, placed on a joint tubercle on each side of the head. This tubercle is separated by a deep cleft from the tubercle bearing the anterior median eyes. The posterior median eyes alone are on a level with the surface of the head. The quadrangle of median eyes is 0.32 mm. wide in front, 0.30 mm. wide behind, 0.37 mm. long. The clypeus is lower than the diameter of the anterior median eyes.

The chelicerae are more or less cone-shaped, short and rather slender. No boss can be seen and the view of the margins and of the fangs is obstructed by the palpi.

The specimen seems to have been once used as a pendant and a channel drilled as far as the surface of the sternum was filled with some yellow resin and sealed with a white substance obstructing the view. When the channel was cleaned and the specimen washed in xylene not only this extraneous substance disappeared, but a great deal of the white emulsion covering the abdomen and the coxae became also cleared. The sternum itself was ruined by the drill, but the maxillae, the lip and the coxae are now plainly visible. The anterior end of the coxo-sternal region is shown in figure 58. The lip is wider than long and has a rounded, thickened anterior edge. The first pair of coxae is separated by about three times the width of the lip. The fourth coxae are narrowly but clearly separated by at least a quarter of their width. None of the coxae has either an apical hook or a basal spur of any kind.

The legs have a spinose appearance, the spines being rather long and stout (figures 63 and 64). There is a slight dissimilarity in the structure of the claws of the first pair of legs. The proclaw (figure 60)

has only six teeth, while the retroclaw has nine (figure 61). The third claw is almost as long as the upper claws and has a single tooth about one third from its base, where it is strongly bent. The upper claws of the following three pairs of legs have from four to five teeth and the third claw is smooth (figure 62). Spurious claws are present, but their number cannot be determined on account of the position of the legs. Neither can any trichobothria be seen. The legs are clothed with simple hair directed at an angle forward, but on the first and second tarsi and on the distal fifth of the metatarsi of those legs short, erect hairs stand at regular intervals between the other hairs.

Legs	Femur	Pat.+Tibia	Metatarsus	Tarsus	Total
I	2.25	2.60	2.00	0.75	7.60
II	1.75	2.00	1.50	0.60	5.85
III	1.20	1.30	0.80	0.45	3.75
IV	1.20	1.60	1.20	0.55	4.55
Leg formula	1	2	4	3	
	4.7	3.6	2.8	2.3	

Length of femur of palp 0.40 mm.

Width of first patella 0.26 mm. First tibial index 10.

Width of fourth patella 0.21 mm. Fourth tibial index 13.

The first femur has a distinctly sigmoid shape (figure 63). *Spines*. First leg, femur dorsal 0-1-1, prolateral 0-1-1, retrolateral 0-0-1; patella dorsal 1-1 (the first a bristle, the second an apical spine), retrolateral 1 at the protruding angle; tibia dorsal 1-1-1, prolateral 1-1-1, retrolateral 0-1-1, ventral 0-2-2; metatarsus dorsal 1-1, retrolateral 1-1. No other spines on first leg. Second leg same as first. Third leg, femur dorsal 1-0-1, prolateral 0-0-1, retrolateral 0-0-1; patella dorsal 1-1 (the first a bristle), retrolateral 1; tibia dorsal 1-1-1, prolateral 0-1-1, retrolateral 0-1-1, ventral 1p-1p-2; metatarsus prolateral 1-1, retrolateral 1-1. No other spines on third leg. Fourth leg same as third except femur dorsal 1-1-1.

There are no spines on the palp, but a fine bristle near the end of the femur, two stout and long bristles on the patella and several fine bristles on the tibia. The two bristles on the patella appear at a first glance to be a pair, but when one considers their position in relation to the articulation points between the femur and the patella they must be certainly homologized with the dorsal 1-1 spines on the patella of the legs. The tibia of the palp has a distinct lateral angular projection (figures 56 and 57). The paracymbium is plainly visible, black, more or less scoop-shaped, without a heel. The median apophysis projects at right angles to the longitudinal axis of the palp, is suddenly attenuated and pointed at the end. The terminal apophysis seems to serve as a protecting shield for the curved embolus.

The abdomen is ellipsoidal, evenly rounded at both ends, 2.25 mm. long, 1.70 mm. wide. It is light colored and has a somewhat silvery appearance. On its back four pairs of light brown dorsal muscular attachment discs are visible (figure 65). The fourth pair is quite small and easily overlooked. The back is clothed with stout bristles of various length. The anterior end of the abdomen overlaps the posterior edge of the carapace. On the ventral surface the spinning group is well visible, typical of the family and the little colulus is visible through the bubble situated in contact with the anterior spinnerets. The ventral abdominal wall has no bristles, but only short, simple hair.

Specimen 8022 is also a mature male. Several of its legs had been cut off, but in other respects it is a well preserved specimen and its palpi show the characteristic structure. The total length of the specimen is 3.9 mm. The carapace is 1.90 mm. long, 1.45 mm. wide, narrowed in front.

Legs	Femur	Pat.+Tibia	Metatarsus	Tarsus	Total
II	1.85	1.75	1.70	0.65	5.95
III	1.40	1.10	1.10	0.50	4.10
IV	1.75	1.85	1.50	0.50	5.60

The abdomen is 2.15 mm. long, silvery grey, with four pairs of dorsal muscular attachment discs. The surface is distinctly rippled.

EUSTALOIDES CALCEATUS spec. nov.

Figures 75-79 and 192

This new species is represented by two specimens, both mature males and both badly mishandled. Fortunately the palpi are well preserved and especially in the type are so situated that the shape of the paracymbium is apparent at a first glance.

Type, specimen 7444. Figure 192. All legs cut off, only the femur and patella of the first pair and the femur of the left second leg remaining. Total length of the specimen 4.4 mm. Carapace 2.0 mm. long and 2.0 mm. wide, almost circular in appearance were it not for the fact that its sides become concave just behind the lateral eyes, where its width is 1.0 mm. The eye group (figure 76) is 0.77 mm. wide. The ratio of the eyes is AME : ALE : PME : PLE = 10 : 7 : 4.5 : 7. This means that the posterior median eyes are relatively appreciably smaller than in the other two species. The quadrangle is appreciably shorter than wide in front, the actual measurements being 0.43 mm. anterior width, 0.39 mm. posterior width, while the length is 0.37 mm.

The cleft between the anterior median and the lateral eye-tubercle is not as deep as in *E. succini*. The lip is of the same type. The sternum (figure 75) is considerably longer than wide and acutely pointed behind the fourth coxae which are separated by about half their width. The first coxae are separated by somewhat more than twice the width of the lip. None of the coxae has any apical hook or basal spur. The first femur is 2.6 mm. long, the second ca. 2.2 mm. The abdomen is 2.7 mm. long, 2.0 mm. wide. It is rounded in front, but posteriorly forms an angle and is distinctly flattened above. Both palpi are fully exposed to view. The terminal apophysis is bilobed (figure 77), the paracymbium has a high heel, giving it the appearance of a boot.

Specimen 6368 is also a mature male and almost as badly mishandled as the type. The posterior end of the abdomen is polished off as well as its ventral surface, and all legs with the exception of the right first and second lack their last two joints. Moreover the carapace is distorted, its posterior declivity apparently bent forward in the process of fossilization, so that the carapace appears to be wider than long. Its maximum width is 1.9 mm., whereas the length is only 1.5 mm. representing almost nothing but the length of the head from the anterior end to the thoracic groove.

Legs	Femur	Pat.+Tibia	Metatarsus	Tarsus	Total
I	1.90	2.25	1.35	0.60	6.10
II	1.70	2.15	1.25	0.55	5.85
III	1.50	1.50	1.10	0.50	4.60
IV	1.70	—	—	—	?

The palpi are so placed that although the paracymbium is plainly visible its heel can be recognized only when the specimen is rotated in oil. Since the appearance of a palp varies depending upon the angle of view, the same right palp is shown in two different positions in figures 78 and 79. The median apophysis is very different from that of *E. succini* and moreover is much smaller and therefore less conspicuous.

EUSTALOIDES MINOR spec. nov.

Figures 66-74 and 193

A well preserved specimen, but badly mishandled and in such dark amber that it can be studied only in monochromatic, strong light. The back of the abdomen was polished off and filled with a white substance which had to be removed before sufficient light could be

admitted to some structures for their study, while the specimen was immersed in mineral oil, as well as for the purpose of photography.

Type. Mature female, 7137. Figure 193. Total length 3.8 mm. Carapace 1.9 mm. long, 1.4 mm. wide between second and third coxae, 0.75 mm. wide in face view. Viewed from above it has the shape shown in figure 67. Its lateral view shown in figure 72 is the result of study, not a drawing made with the aid of a camera lucida as the others are, because there is not a single position in which the complete carapace could be viewed from its side. Nevertheless I believe the reconstruction to be more or less correct. The median crest of hair can be seen only with difficulty. The head is clearly outlined by the sulci which converge at the anterior end of the short, longitudinal thoracic groove. The eyes protrude beyond the anterior edge of the carapace. The eye group (figure 71) is slightly narrower than the head. The anterior median eyes are the largest, in contact with each other and but slightly removed from the lateral eyes. The four median eyes are on a tubercle (figure 70) and the two lateral eyes of each side are also on a tubercle. The clypeus is lower than the diameter of the anterior median eyes. Measurements are very difficult and not reliable on account of the darkness of the amber.

The chelicerae are slightly geniculated, stout, without boss. Their margins are not visible. The coxo-sternal region is shown in figure 74. The sternum is flat, 0.85 mm. long, 0.65 mm. wide, truncated and distinctly emarginate in front, bluntly pointed behind. Its surface is sparsely clothed with coarse hair. The first coxae are wide apart and distinctly larger than the others. The fourth coxae are sub-contiguous.

Legs	Femur	Pat. +Tibia	Metatarsus	Tarsus	Total
I	1.75	2.20	1.65	0.65	6.25
II	1.40	1.60	1.00	0.50	4.50
III	1.20	1.10	0.70	0.45	3.45
IV	1.25	1.25	0.75	0.50	3.75
Leg formula	1	2	4	3	
	3.3	2.4	2.0	1.8	

Spines. First leg, femur dorsal 0-1-1, prolateral 0-1-1; patella dorsal 1, prolateral 1; tibia dorsal 1-0-1 (the first a bristle), prolateral 1-1-1, retrolateral 0-1-1, ventral 0-2-2; metatarsus prolateral 1-1, retrolateral 1-1. No other spines on first leg. Second leg, femur dorsal 0-1-1, prolateral 0-0-1, retrolateral 0-0-1; patella dorsal 1, retrolateral 1; tibia dorsal 1-0-1, prolateral 1-1-1, retrolateral 0-1-1, ventral 0-2-2; metatarsus prolateral 1-1, retrolateral 1-1 as in first leg, but the spines are distinctly stouter. No other spines. The spines

on the third and fourth leg cannot be studied on account of the position of the legs. Neither the trichobothria, nor the claws can be studied. A palpal claw is present and is shown in figure 66. The pedal claws are apparently more or less of the same type.

The abdomen is ellipsoidal, evenly rounded at both ends, 2.5 mm. long, 1.9 mm. wide. Its anterior end overlaps the posterior edge of the carapace. The back of the abdomen, as already mentioned, had been polished off, but the hair in front and behind the opening is sparse and coarse and sticks out through the white emulsion which partly covers the body wall. The spinning group is of the usual type (figure 73). There is a well developed colulus present and in front of it the tracheal spiracle appears as a little crescent. The epigynum shown from below and in profile, is quite prominent and characteristic. It seems to be complete. At least when one examines the specimen in oil one can look at the inner surface of the epigynum through the artificial opening on the back of the abdomen.

It is always difficult to decide in spiders whether a single specimen belongs to the same species as specimens of the opposite sex. In most species of the family Argiopidae the females are larger than the males in now living representatives. *Eustaloides minor* is smaller than the males which I have described as *E. setosus*, *E. calceatus* and *E. succini* from Baltic amber. This is the reason why I thought it advisable to place the female into a new species. There are of course other differences of structure, which may be sexual, but may be specific as well.

Another specimen, 7191, which I designate as paratype, is ca. 4.6 mm. long, the greater size being due to a considerable distention of the abdomen. It is also a mature female, not nearly as well preserved as the type, but with the epigynum well visible. The amber is light colored, but full of imperfections making the study difficult.

Subfamily METINAE

Genus ACROMETA Petrunkevitch 1942

Type *Acrometa cristata* Petrunkevitch

ACROMETA CRISTATA Petrunkevitch

Five mature males of this characteristic species, conforming in almost every detail with my description and figures of 1942. Only specimen 7189, which is poorly preserved, looks at first glance somewhat different, inasmuch as its head appears to be much broader.

I think this is due to distortion in fossilization since the palpi, the crest on the carapace and the shape and investment of the bristles are typical.

Subfamily THERIDIOSOMATINAE

Genus *ELUCUS* Petrunkevitch 1942

Type *E. inermis* Petrunkevitch

In studying amber spiders one meets with species which combine characters of several Recent families. Any deviation due to distortion or to loss after death and fossilization can be easily recognized and discounted. Thus hair, bristles and even spines may be lost even in Recent spiders, while the structure of claws and the number and arrangement of trichobothria are often difficult to determine. When, however, every structural detail is present and can be studied, then such intergrading of characters may mean only one of two things. Either the existing classification is wrong, being applicable only to extreme forms of what should be regarded as a single family, or else, in the case of fossil species, we are in the presence of an efflorescence of characters before the process of natural selection eliminated species with intergrading characters. A case in question is presented by the Genus *Elucus*, which I proposed for a species of spider from the Baltic amber and placed in the Subfamily Theridiosomatinae. That subfamily includes only eight genera of Recent spiders, all small in size, with rather short legs, resembling some Erigonidae in appearance. *Elucus inermis* resembles more a spider of the Family Linyphiidae or some Theridiid by its general appearance, yet is distinct from both. It has the legs, the maxillae and the lip of a Linyphiid, but its male palp lacks a paracymbium so characteristic of that family. It cannot be placed in the Theridiidae, because it lacks a tarsal comb, or at least the ventral row of bristles on the fourth tarsi does not differ appreciably from the dorsal row or the lateral rows. Only if these rows were lost or were replaced by considerably smaller hairs could the ventral row be likened to a comb. The color of the eyes does not come under consideration in amber spiders, because all eyes become transparent, so that a distinction between so called diurnal and nocturnal eyes is impossible unless the shape is peculiar. But in *Elucus* the eyes are round. In the first half of the 19th century, i.e. at the time when Koch and Menge published their important works, Linyphiidae and Theridiidae and even Mimetidae were still considered to belong to a single family. The discovery of the second species of *Elucus* only

confirms the impossibility of assigning this genus either to the Theridiidae or to the Linyphiidae. For this reason I still place it in the Subfamily Theridiosomatinae although it does not conform unconditionally with that group either.

ELUCUS INFELIX spec. nov.

Figures 83-89, 200 and 201

Type, 7002. Figure 200. Mature male. Total length 2.2 mm. Carapace 1.0 mm. long, 0.90 mm. wide, 0.35 mm. high. Abdomen 1.25 mm. long, 0.90 mm. high, 1.00 mm. wide. The appearance of the spider is best understood from the photograph taken in side view because of the shape of the piece which makes the study of the dorsal surface difficult and photography impossible. The side view is also shown on a larger scale in the drawing (figure 86) in which three femora of the left side are shown, to emphasize their respective lengths, while the first femur is omitted for lack of space and because it obstructs the view of the eyes. The dorsal view of the carapace is shown in figure 84. It differs from that of *E. inermis* in which species the width of the head is greater than that of the eye group. In *E. infelix* the eye group is 0.47 mm. wide and the eyes project beyond the edge of the head on each side. The ratio of the eyes is: AME : ALE : PME : PLE = 9 : 5 : 8 : 5, i.e. the lateral eyes which are contiguous and are placed on each side of the head on a joint tubercle are the smallest, while the posterior median eyes are only a little smaller than the anterior median eyes. The eye group cannot be studied under high power, nor can the length of the quadrangle be measured. Its width in front is about the same as behind, and the clypeus appears to be about as high as the diameter of the anterior median eyes. The sternum is distinctly convex. Its shape cannot be studied, but it is certain that the first coxae are wide apart and the fourth coxae are separated by a little more than their width. Of the mouthparts only the chelicerae can be seen (figure 85). In a certain position and light three teeth may be faintly seen, but it is not possible to determine on which margin they are. The legs are long and thin, practically without spines except for very fine dorsal ones of which there are 1-1 on all patellae and 1-1 on all tibiae. The claws are slightly dissimilar although their outline along their dorsal line is more or less the same. But the proclaw is smooth, while the retroclaw has three teeth on the first and second leg (figures 87-89) and only one tooth on the third leg. The claws of the fourth pair of legs cannot be seen in profile. The third claw is smooth on all legs. There seem to be two pairs of serrated bristles at the end of the tarsi.

Legs	Femur	Pat.+Tibia	Metatarsus	Tarsus	Total
I	2.40	2.40	2.50	1.05	8.35
II	1.85	1.85	1.85	0.85	6.40
III	1.05	0.90	0.85	0.45	3.25
IV	1.65	1.55	1.55	0.70	5.45
Leg formula	1	2	4	3	
	8.3	6.4	5.4	3.2	

Compared with the measurements of the legs in *Elucus inermis* the new species has relatively slightly longer legs. An interesting difference is in the measurements of the third leg, for in *Elucus inermis* the patella with the tibia are almost by a quarter longer than the femur, and the metatarsus by two fifths longer than the femur; in *E. infelix* the femur is the longest, the metatarsus the shortest and the difference between the two amounts to no more than 10%.

Both palpi are remarkably well preserved and their internal structure is clearly visible although it requires careful study, and the free end of the embolus is quite colorless, so that it easily escapes observation. Figure 83 is drawn at a large scale and shows that on leaving the sperm receptacle the duct forming the embolus makes nearly one and one-half turns of a spiral. At the end of the bulb the pointed conductor appears more or less in the same place as in the type (1942, figure 115) which I mistook then for the embolus (page 341). The latter is presumably not visible in the position in which the palp appears on the figure. There is however a well visible difference in the structure of the tibia which has a very distinctly protruding angular apophysis in *E. infelix* (figure 83.) It has also two trichobothria, one behind the other. The cymbium is covered with thin hair with exception of its end on which several very thick hairs may be seen.

To this species I refer another specimen, a mature male No. 7127 *a*, shown in figure 201. The specimen is not nearly as well preserved as the type, the legs are all flexed and the dorsal surface of the carapace and abdomen is missing, having been cut off by the previous owner for mounting on a slide. The identification is therefore not beyond possible doubt. The legs look somewhat stouter, but have the same type of hair and the claws visible on one of the legs resemble those of the type. The structure of the palpi cannot be seen because of their position, but one can discern at the end a structure which looks like a short thorn.

ELUCUS INERMIS Petrunkevitch 1942

Figure 199

The type of this species is in the British Museum and is a mature male. I refer to this species with reservation a defective female, No.

7707 *a* of the Mus. of Comp. Zcöl. shown in figure 199 photographically. The abdomen is missing and the spider can be seen only in front view.

Family EPHALMATORIDAE, new

There are three genera of spiders found in the Baltic amber, which are characterised by the possession of enormous ventral spines on the tibia and metatarsus of the first and second pair of legs. Two of these genera, *Eostasina* and *Esuritor*, I have described in 1942. The third, new genus *Ephalmator* is described here for the first time. The three genera belong to three different families and their possession of unusually long spines on the same legs and in the same places is a striking example of parallelism in evolution. The separation of the three genera is quite simple and beyond all possibility of a mistake unless, indeed, the required characters are missing through loss of appendages and either loss or obstruction of the view of the spinnerets and eye group. The genera may be separated as follows:

1. Two claws. Legs laterigrade, long, in order 4123, but with little difference in length. First and second tarsus and metatarsus finely scopulate. First and second tibia with four pairs of long, ventral spines, first and second metatarsus with three pairs of similar spines.
Genus *Eostasina* (Eusparassidae)
- Three claws. 2
2. Order of legs 4132. Trichobothria numerous. In addition to the long ventral spines on the metatarsus and tibia of the first and second pair of legs, there are many spines of normal length on all legs. Eye group almost as wide as head. Spinnerets cylindrical, posterior pair slightly longer than anterior pair. Colulus present. Genus *Esuritor* (Pisauridae)
- Order of legs 1423. A single trichobothrium on tarsus. Legs without other spines than the long ventral ones on first and second tibia and metatarsus. Only the fourth tibia has a subapical pair of very small ventral spines. Head considerably wider than the eye group. Spinnerets cone-shaped, anterior pair much stouter than posterior pair. Colulus wanting.
Genus *Ephalmator*, new (Ephalmatoridae)

The creation of a new family is always a matter for serious consideration. In the present case, as may be seen from a comparison of the characters of the new family given below with the characters of the other two families the Ephalmatoridae may be easily separated from the latter. But this is not the case when one considers other families of the Branch Trionychae of the Suborder Dipneumonomorphae. The Ephalmatoridae have some characters in common with several other families, namely Argiopidae, Erigonidae, Theridiidae,

Agalenidae and even Zodariidae. Yet they also differ from each of these either by the lack of important characters or by the possession of characters lacking in the others. Thus the lack of a comb on the fourth tarsi and the possession of powerful ventral spines makes their inclusion in the Theridiidae impossible. Complete absence of serrated bristles and of spurious claws as well as of a colulus separates them from the Argiopidae; the shape of the spinnerets and the lack of plumose hair and of the characteristic row of tarsal trichobothria alienates them from the Agalenidae; the Erigonidae have spurious claws and their palp in males has a tibial apophysis, characters lacking in Ephalmatoridae. The shape of the spinnerets and the disposition of the eyes as well as the peculiar spines separate them from the Zodariidae. If it were not for the high degree of specialization immediately apparent when one studies the external features of the Ephalmatoridae, one would be inclined to consider them as ancestral forms of the above mentioned families. This is quite unlikely. All the enumerated families are already represented in the Baltic amber and (with the exception of the Zodariidae) were more common, if judged by the number of known species. Moreover, they all exhibit already the characteristic features of the Recent representatives. One is forced to the conclusion that the Ephalmatoridae represent a branch which became early specialised and for some reason was unable to survive.

Characters of the family. Dipneumonomorph spiders of the Branch Trionychae. Three claws. Serrated bristles, spurious claws and claw tufts wanting. Fourth tarsus without a comb. A single trichobothrium on tarsi. Chelicerae with a boss and transverse margins. Lip free, flat, not thickened at end. Maxillae parallel. Legs prograde. Trochanters not notched. First coxae wide apart. Six spinnerets. Anterior pair close together, cone-shaped and much stouter, but equally long with the posterior pair. Both pairs capable of producing silk with viscous droplets. Colulus wanting. Hair simple. Male palp without paracymbium and without tibial apophysis.

Genus EPHALMATOR, new

In addition to its familial characters the genus presents the following distinguishing features: Eye group narrower than head. First and second tibia with 2-2-2-1p ventral spines of unusual length. Pro-marginal of chelicerae with a scopula of long bristles arranged in a single row; retromarginal smooth. Sternum fairly convex. Legs short and stout. Type *E. fossilis*.

EPHALMATOR FOSSILIS spec. nov.

Figures 90-108, 195 and 196

Type: figure 90-98, 102, 103, 105-108; 196. Paratype: figures 99, 100, 104, 175 and 195.

Type. Mature male, No. 7882. Figure 196. Originally in light colored amber with numerous planes of cleavage. On polishing the surface of the piece and soaking it in mineral oil, the amber became quite clear. The only imperfections are the presence of an air-bubble which pressed in and obstructed the view of the left side of the abdominal ventral surface, and the damage to two legs: the right second leg lacks the metatarsus and tarsus, the right third leg is missing beyond the femur.

Total length 2.65 mm. Carapace 1.30 mm. long, 1.00 mm. wide between second and third coxae, 0.50 mm. wide in the region of the eye group, the latter being only 0.50 mm. wide. Viewed from above (figure 90) the carapace reveals a rather long head clearly outlined by the cephalothoracic sulci. There are practically no hairs on the carapace, except for the very few on the head. Viewed from the side the carapace (figure 94) shows that its highest point is at the posterior end of the head. From here on it slopes forward in a gentle curve, while its posterior declivity is straight and much more inclined. The thoracic groove is longitudinal and is situated on the posterior declivity. The eight eyes are arranged in two rows, both slightly procurved (figure 93). The anterior median eyes are the smallest and are closer to each other than to the ALE. The four eyes of the posterior row are equal in size and separated by less than their diameter. The lateral eyes on each side are elevated on an elongated, low tubercle. The clypeus is equal to three diameters of the AME and is, therefore, not as high as the length of the quadrangle of medians. The latter is much narrower in front than behind and considerably wider than long. The second row of eyes is wider than the first row. All eyes are round.

The chelicerae are stout and rather short. The boss (figure 102) may be plainly seen in some positions, but is not prominent. The margins are transverse. The promargin has a scopula composed of fairly long and stout bristles. The retromargin is smooth. No teeth are present on either margin. The fang is short, quite pointed and seems to be sinuous along its dorsal line.

The lip is flat, trapezoidal (figure 95), wider than long in ratio 10 : 7, not thickened at the end, but provided with a few short hairs. The sternum is longer than wide in ratio 28 : 23, transversely truncated in front, bluntly pointed behind. The lateral margin of the posterior

end of the sternum is distinctly concave, so that the end of the sternum has the appearance of a nipple. The surface of the sternum is distinctly, though not strongly convex and sparsely clothed with short, simple hair directed forward and inward. The first coxae are the largest and are wide apart. The fourth coxae are next in size and are separated by about their width. None of the trochanters are notched. The outer edges of the maxillae are almost parallel. Their front is truncated and bears a serrula. The inner edge is angular, with a heavy scopula on its anterior, short portion. The long, posterior portion of the inner edge appears to be somewhat concave.

Legs	Femur	Pat. +Tibia	Metatarsus	Tarsus	Total
I	1.00	1.17	0.62	0.25	3.04
II	0.75	0.95	0.65	0.25	2.55
III	0.67	0.65	0.45	0.25	2.02
IV	0.87	1.00	0.60	0.30	2.77
Leg formula	1	4	2	3	
	2.3	2.1	2.0	1.6	

Width of first patella 0.20 mm. First tibial index 17.

Width of fourth patella 0.16 mm. Fourth tibial index 16.

First tibia with 2-2-2-1p ventral spines of unusual length (figures 107 and 108). First metatarsus with 2-2-2 ventral spines, the end of the proximal pair reaching beyond the base of the second, while the considerably shorter third spine still reaches far beyond the end of the metatarsus. The second leg has a similar arrangement of spines, but in this case even the retroventral spines are still longer. The fourth tibia has 0-2-2 ventral spines, both pairs very small and easily overlooked. All tarsi have three claws, but the third claw is small and difficult to see among the hairs situated at the end of the tarsus and partly hiding it. The upper claws (figure 103) are similar and have six long teeth on the anterior tarsi, but only five on the fourth tarsi (figure 105). Whether the third claw is smooth or has a single tooth as shown in the figure, cannot be decided with certainty on account of the hairs which partly obstruct the view. A single trichobothrium can be seen on the anterior tarsi. There may be two trichobothria, one behind the other on the metatarsi, but I do not feel sure about it. There is a flat pocket of air there, the edge of which easily may be mistaken for a trichobothrium in certain light. One thing is sure, however, that there is no row of trichobothria on either joint.

The anterior surface of the chelicerae is covered with long, stout, curved bristles, standing at considerable intervals. There are similar, but shorter and less stout bristles at the end of the trochanter on all legs. The legs themselves have no bristles, but are clothed with simple

hair standing in rows as shown in figure 107. These hairs become stouter on the tarsi of the first and second pair of legs. The end of these tarsal hairs is blunt. There are no serrated bristles of any kind on any joint of the legs, nor any plumose hair.

The abdomen is neatly ellipsoidal, only slightly flattened on its ventral surface. As shown in figure 90 it overlaps the posterior end of the carapace considerably. It is 1.6 mm. long, 1.15 mm. wide. On its sides it appears to be slightly corrugated and the individual corrugations continue from the one side to the other by passing across the dorsal surface of the abdomen near its end. The left half of the ventral surface of the abdomen is pressed in by a large air-bubble which obstructs its view. But on the right side the view is clear and one can see plainly the corrugated cover of the right lung and the lung-spiracle. The tracheal spiracle cannot be seen partly because of the distortion due to the air-bubble, partly perhaps because tracheal spiracles are extremely rarely visible in amber spiders. One thing seems to be sure that the spider did not have a pair of tracheal spiracles, nor a spiracle far in advance of the spinnerets, for in such cases the arrangement of the hair appears to be modified by the presence of the spiracle. No such change in the arrangement of the hair on the venter of the abdomen can be noticed. The conclusion seems to be fairly certain that the tracheal spiracle was single and was situated close to the spinnerets, unless indeed it was altogether wanting, a possible, but extremely rare case in spiders.

A colulus is definitely wanting. The six spinnerets form with their bases almost a circle (figure 96). The anterior pair is cone-shaped but their second joint is in the shape of a very low cylinder the top of which is circular and quite flat (figure 97). In good light and by placing the specimen at a proper angle one can see on this flat surface 13 small spinning tubes and one large one arranged as shown in the figure, the large tube pointing toward the plane of symmetry. The large tube is of the type of so-called spigots, but the smaller tubes are also short and much of the same shape. The anterior spinnerets are more or less in contact with each other not only at their base, but along the plane of symmetry as well. They are easily twice as stout as the posterior pair. The latter are also cone-shaped and two-jointed. The top of their second joint is also round and flat and bears one large and 11 small spinning tubes (figure 98). The large spigot is directed toward the plane of symmetry. The median spinnerets can be seen, but not well enough to make out the spinning tubes. The anal tubercle is large, single jointed, covered like the spinnerets with stout, blunt, curved hairs. The ventral and dorsal surfaces of the abdomen are clothed with short, simple hair. This hair is even shorter than that on the sternum, so that it may be seen only in proper lighting.

Both palpi are well preserved, but on account of their position their structure is difficult to make out. It is quite certain that the patella is larger than the tibia and has neither spines nor apophyses. The tibia also has no apophysis, but it has 1-1 dorsal spines (figure 91) the first of which is of considerable length and fairly stout. The cymbium is more or less bowl-shaped. Under its end which is almost rectangular as shown in figure 92, a pair of black, triangular apophyses can be seen. The embolus seems to form a spiral, three turns of which can be seen in side view, but the presence of white emulsion on the bulb makes the picture indistinct.

The carapace, lip, sternum and legs must have been in life of a dark brown color which is still present in the chitin. Through a chance trick air filled the space between the chitin and the amber. When a beam of light strikes the surface of this sheet of air, the spider appears to be silvery grey. When the beam is directed so that it penetrates through the air, the spider appears to be dark brown. The chelicerae and maxillae are almost black. The abdomen very light yellow. Notwithstanding its small size, the spider has the appearance of a very sturdily built creature and, for a male, the relative length of its legs is much shorter than is the usual case in orb-weavers.

The *Paratype* is also a mature male of about the same size and appearance. In some respects it is not as well preserved as the type, and the amber is full of bubbles and planes of cleavage reflecting light. Besides, the venter is partly coated with white emulsion. All this makes its examination tedious and slow and photography very difficult. The maxillae, lip, sternum and coxae are not at all visible. But the important structures, such as the legs with the enormous ventral spines, the claws and the spinnerets are perfectly visible. The palpi are also as well preserved as in the type, so that there can be no doubt whatsoever about the conspecificity of the two specimens.

Total length measured as sum of the length of the carapace and of the abdomen is 2.75 mm. The abdomen is twisted out of its proper position, and does not overlap the posterior edge of the carapace as in the type. On the contrary, it leaves the petiolus exposed to view and makes the measurement of the total length of the specimen greater than it would be, if the abdomen were in its proper position.

Carapace 1.25 mm. long, 0.95 mm. wide between second and third coxae. Head 0.60 mm. wide. Eye group 0.35 mm. wide. The disposition of the eyes and the shape of the carapace is the same as in the type. The thoracic groove is longitudinal, situated on the posterior declivity at about its own length behind the highest point of the carapace. There are a few simple hairs on the head, but none on the thoracic portion the surface of which is finely rippled all over, giving it a silvery appearance.

The eye group is difficult to study. The diameter of the outer surface of each eye is considerably greater than that of its inner surface. For example the outer disc of the PME has a diameter of 0.09 mm., the inner disc 0.05 mm., leaving for the iris a circular band fully 0.02 mm. wide. When one studies the eyes at one angle of the incident beam and sees only the inner meniscus, the eyes appear small and far apart. When the ray is so directed as to illuminate only the outer meniscus the eyes appear of normal size, as they would appear in life with the iris present. The measurement of the eye group is easier by taking the distances between the centers of the eyes, the centers remaining the same for both the outer and inner meniscus. Thus measured the distance between the centers of the two PME is 0.10, between the centers of a PME and a PLE of the same side 0.11 mm., i.e. the median eyes of the second row are slightly nearer together. The quadrangle of medians is distinctly narrower in front than behind and considerably wider than long. The AME are the smallest, then the ALE, while the eyes of the second row are the largest and are all four of the same size. The lateral eyes on each side of the eye group are on a common, elongated tubercle. The second row is distinctly wider than the first. The clypeus is equal to one half the length of the quadrangle. Behind the carapace the dorsal sclerite of the petiolus is in plain view.

Only the base of the chelicerae are visible, but the boss stands out clearly.

Legs	Femur	Pat.+Tibia	Metatarsus	Tarsus	Total
I	1.05	1.10	0.55	0.25	2.95
II	0.80	0.85	0.55	0.25	2.40
III	0.65	0.70	0.40	0.25	2.00
IV	0.90	0.90	0.55	0.25	2.60
Leg formula	1	4	2	3	
	2.4	2.1	1.9	1.6	

The femur of the first pair of legs is considerably stouter than those of the other legs and is slightly compressed laterally. The upper claws are similar, curved, with long teeth. The third claw is smooth and small, difficult to see. The spination of the legs is the same as in the type and the ventral spines of the first and second pair of legs stand out clearly. (Figures 100 and 101.)

The abdomen is 1.5 mm. long, 1.05 mm. wide. The entire group of spinnerets is plainly visible and excellently preserved. The spinnerets have the same structure as in the type, but what makes the paratype of particular interest and of great importance is the fact that several threads of silk are still attached to two of the spinnerets (figure 99).

Examination under higher power (figures 104 and 175). reveals that each thread has a row of viscous droplets of the same appearance as those seen in any Recent orb-weaving spider. Some of the droplets retained their original shape of a globule, others lost their individuality by fusing into a single, large globule. This is the common fate of Recent viscous droplets on spiders' threads, whenever they are brought in contact with a surface or substance to which they may adhere, the strength of the attraction being greater than the surface tension of the globules. It is remarkable and fortunate indeed that amber resin did not have that effect, for the preservation of the viscous threads makes it quite certain that *Ephalmator* used viscous silk for the capture of its prey. One can see even the thread to which the droplets are attached. The spider must have produced the silk when it was caught in the sticky resin and before it died. The globules stop not far from the spinning tubes, but the last short stretch of silk is free of droplets. The presence in amber of viscous silk was noticed and described already by Bachofen-Echt in 1934. But he gave only a figure of the silk, the question of its producer was left unanswered. Bachofen-Echt ascribes the silk to an orb-weaver of an unknown family, but he neither figures, nor describes the spider and the inference is that the piece of amber did not contain a spider. Whether *Ephalmator* described here was an orb-weaver or used viscous silk only for enswathing its prey, remains of course problematic. But the production of viscous threads by *Ephalmator* stands beyond dispute.

41 Family EUSPARASSIDAE

Subfamily EUSPARASSINAE

Genus CADUCEATOR Petrunkevitch 1942

Type *C. minutus* Petrunkevitch

CADUCEATOR QUADRIMACULATUS spec. nov.

Figures 125-127, 202 and 203

Type, specimen No. 7221, (figures 202 and 203), Mus. Comp. Zoölogy, Harvard, mature female. The type and only specimen of this interesting Baltic Amber spider resembles so closely in coloration and in many structural details the species which Koch described under the name of *Ocypte triguttata* referred by me in 1942 to the then new genus *Ablator* of the Family Clubionidae, that I was led at first to believe that the specimen described below belonged to the same

species and differed only in sex. The Genus *Ocypete* was proposed by Koch and is now generally regarded to be a synonym of the genus *Heteropoda* of the Family *Eusparassidae*. *Heteropoda*, like other *Eusparassidae*, has distinctly laterigrade legs. Of the legs of his *Ocypete triguttata* Koch merely says that their length agrees with that of the other species (of the genus): "Die Beine stimmen in der Länge mit den andern Arten überein; sie sind dünn und nicht sichtbar behaart." (p. 86). He does not state that they are laterigrade, nor does his figure 141 on Plate XVI show a laterigrade spider. Moreover, Menge, in his footnote on page 86, states that both Koch's description and his figure are incorrect and that the spider belongs to the Genus *Pythonissa*. "Offenbar gehört dieses hübsche Thierchen zur Gattung *Pythonissa*. Der abgesetzte, mit von beiden Seiten her aufliegenden Härchen bedeckte Kopf, das gewölbte Rückenschild, der mit feinen Haarschüppchen bekleidete, gewölbte Hinterleib, die nackten Füße, die kurzen Fusskrallen sind Merkmale die *Ocypete* nicht zukommen. Die Augenstellung ist allerdings ähnlich aber nicht gleich, denn die vordere Augenreihe ist etwas rückwärts gebogen und steht mit der hintern auf der wenig nach vorn geneigten Kopffläche. Die Abbildung Fig. 141 ist nicht ganz genau. M." Menge studied Koch's original specimen and no other specimen of the species was known at the time. The Genus *Pythonissa* was also proposed by Koch and is now generally regarded to be a synonym of *Gnaphosa*, a representative of the prograde Family *Drassodidae* (= *Gnaphosidae*). Menge's footnote, especially his reference to the scales covering the abdomen, and Koch's figure and description of the palpi induced me in 1942 to refer the two specimens in the collection of the British Museum to the species *triguttata*, and to place it in the Family *Clubionidae*, a family closely related to the *Drassodidae* by its external characters. The type (figure 125) of *Caduceator quadrimaculatus* is a beautifully preserved specimen showing all important characters except the claws which can be studied only in reflected light under low power because the legs are flexed under the body. But the legs are distinctly laterigrade in their proportions and are even held in a laterigrade manner, which is not always the case in specimens preserved in amber because they struggled in an attempt to free themselves of the sticky medium in which they were caught.

Total length 3.43 mm. Carapace 1.50 mm. long, 1.35 mm. wide, with a short, line-like thoracic groove the anterior end of which is 1.12 mm. behind the anterior edge of the carapace, i.e. at a considerable distance from it. The posterior declivity begins immediately behind the thoracic groove and is covered by the anterior portion of the abdomen. The posterior edge of the carapace is therefore not visible.

The lateral edge is distinctly flattened or margined as far as the outer edge of the chelicerae, a peculiarity which it shares with *Ablator triguttatus*. The eye group shown in figure 126 is distinctly narrower than the head. Both rows are slightly recurved and the first row is considerably shorter than the second row. The posterior lateral eyes are about twice as large as the other eyes which are more or less equal. Exact measurement, however, is difficult because the individual eyes are visible only in certain positions relative to the source of light and no more than five eyes can be seen at once in any position. The figure is therefore a composite one and only partly drawn with the aid of the camera lucida. But it seems certain that the quadrangle of medians is much narrower in front than behind. The surface of the carapace to the outside of the white bands is very finely rippled and quite devoid of hair. The median dark band enclosed between the two white bands is very sparsely clothed with quite short, light colored, simple hairs with large intervals between them. The median band is as wide as the eye group from which it extends backward to the thoracic groove. The two white bands unite in a curve across the thoracic groove and, since they are wider than the length of the groove, the posterior edge of the curve disappears under the overlapping abdomen. The color of the white bands is due to simple, white hair which densely clothes this region of the carapace. The hair is recumbent, directed downward and outward and covers the underlying chitin completely. No scales are on the carapace.

The chelicerae are short, stout, parallel and vertical. Neither their armature, nor the fangs can be seen. The lip is longer than wide and reaches beyond the middle of the more or less parallel maxillae. The sternum (figure 127) is oval, longer than wide in ratio 4 : 3, truncated in front, bluntly pointed behind. Its sides are slightly excavated opposite each coxa. The surface is slightly convex and sparsely clothed with short hair. The first coxae are wide apart, the fourth coxae are separated by about their width. There are no scopulae on the legs and the spines are few, short and difficult to see. There are 1-1 dorsal spines on all femora, 2-2 ventral spines on tibiae and metatarsi. On the fourth tibia one can see a single retrolateral spine. The claws are well visible, but as already explained cannot be studied under high power.

Legs	Femur	Pat. +Tibia	Metatarsus	Tarsus	Total
I	1.05	1.35	0.85	0.55	3.80
II	1.10	1.30	0.85	0.60	3.85
III	1.05	1.15	0.85	0.55	3.60
IV	1.10	1.45	1.25	0.65	4.45
Leg formula	4	2	1	3	
	2.9	2.5	2.5	2.4	

The abdomen is 2.15 mm. long, 1.35 mm. wide about three fifths of its length from the anterior end. Anteriorly it is distinctly concave, its posterior end is rounded, its dorsal surface distinctly flattened. This entire surface is densely clothed with short, recumbent hair of two kinds. Most of the surface is clothed with dark yellowish brown hair which is replaced in four spots by white hair. One of these spots is at the anterior end, another at the posterior end of the abdomen. The pair of white spots in the middle of the abdomen are elongated, oblique and almost in contact with each other in the plane of symmetry. (Figure 125.) There are no scales. The ventral surface is golden brown, sparsely clothed with light colored hair. The entire surface behind the epigynum is transversely corrugated. The spinnerets are well visible and even the tips of the median pair can be seen. The anterior and posterior pair are about equal, short and stout. The epigynum (figure 127) is very large and shiny, with a pair of round, clearly visible receptacles.

Genus ADULATRIX Petrunkevitch 1942

Type *A. fusca* Petrunkevitch

The reader will find in my Study of Amber Spiders a key to the genera of the Subfamily Eusparassinae, four of which are found in the Baltic Amber. Only one of the four is represented in the Recent fauna. A key to the four species of Adulatrix is also given in the same paper. Only *Adulatrix parva* Petrunkevitch is represented in the collection of the Museum of Comparative Zoölogy. Since the description of the types belonging to the British Museum was made by me in great detail, nothing new could be added here. But specimen No. 7662 is so unusually well preserved that I give a photograph of it here in figure 208.

Genus ZACHRIA L. Koch 1875

Type *Z. flavicoma* L. Koch

The genus Zachria was established by L. Koch for a species of Recent spider living in Australia. In 1946 I referred to this genus, a Baltic amber species, *Z. peculiata*, which resembles in some of its characters species of the genus Adulatrix, but differs from the latter by the order of its legs and by the presence of a scopula on all four tarsi. The specimen which I refer here to the genus Zachria and which is described in detail below, is unfortunately in such condition that its generic affiliation is far from certain. The specimen was badly mishandled

by whoever owned it before it was purchased by the Museum and placed in my hands for study. The entire roof of the carapace was polished off, leaving only a narrow strip and the first row of eyes, but fortunately enabling one to see the complete circumference and measure its length and width. Several legs are also mutilated and the first pair was evidently lost by the spider before it was engulfed in the still liquid amber resin. Of the second right leg the metatarsus and tarsus have been polished off and the second left leg is preserved only to the end of the patella. The right third leg and both fourth legs are fortunately complete. Yet the identification of the genus depends upon the configuration of the entire eye group and the relative size, spination and other features of the first and second pair of legs. But while the generic affiliation remains therefore only as tentative and probable, the specific characters are so well and so completely preserved, that there should be no difficulty in recognizing the species in the event another specimen of the same sex were found.

ZACHRIA DESIDERABILIS spec. nov.

Figures 109-118 and 205

Male. Type, specimen No. 7139.

Total length with chelicerae 5.6 mm. Carapace 3.25 mm. long, 1.50 mm. wide in front, 3.00 mm. wide between second and third coxae. The shape of the carapace is shown in figure 111. It resembles a great deal that of *Adulatrix fusca*. The area which is missing is outlined in the figure. The first row of eyes is distinctly shorter than the width of the carapace in that region, being only 0.87 mm. long. As the figure 113 shows on a larger scale, the lateral eyes are much larger than the median ones. The latter are difficult to see and are somewhat nearer the lateral eyes than each other. The second row is missing, but was presumably somewhat longer than the first. The clypeus is very difficult to measure and is over three diameters of the anterior median eyes (or since the anterior lateral eyes are much better visible the clypeus may be stated to be equal to their diameter and a half.) The surface of the carapace is covered with short hairs directed forward and inward. On the clypeus one can see a transverse row of bristles.

The chelicerae are stout and short, with parallel outer edges and parallel inner edges as far as their middle, from thence they diverge as shown in figure 113. The shape of the fangs may be seen in a certain position of the specimen, but the armature of the margins is not visible. The sterno-coxal region is shown in figure 117. The lateral outlines of

the sternum are not clear, but the anterior end is plain enough and appears to be slightly emarginate. The curved anterior edge of the lip can be seen without difficulty because the lip happens to be of a grey color, whereas the maxillae and the sternum are more or less yellow. But the proximal end of the lip is not as plainly visible. It seems, however, to be narrower as shown in the figure. The posterior end of the sternum is drawn out into a blunt point separating slightly the fourth coxae. The first coxae are wide apart, but not as wide as the second pair, and the sternum is also widest between the second coxae. While its width cannot be measured exactly, it seems to be as wide as long. Its surface, where not appearing bare in consequence of loss of pubescence, reveals the presence of fairly stout and rather short hair.

Legs	Femur	Pat.+Tibia	Metatarsus	Tarsus	Total
I	—	—	—	—	—
II	3.57	4.86	—	—	—
III	3.00	3.71	2.71	1.28	10.70
IV	3.29	3.86	3.15	1.45	11.75

The following spines can be seen. On the second femur 1-1 dorsal. On the second tibia 2-2-2 ventral spines of which the first pair does not reach the base of the second pair, while the latter just reaches the base of the third pair. In other words these spines are long, but not exceptionally so.

On the third leg: femur dorsal 1-1, prolateral 1-1, retrolateral 1-1, ventral 0, but it is possible that a third spine is present on the three surfaces bearing spines. Patella retrolateral 1, elsewhere 0. Tibia dorsal 0, prolateral 1-1, retrolateral 1-1, ventral 2-2-2. These spines are much longer than the corresponding ones on the second leg. Metatarsus dorsal 0, prolateral 1-0-0, retrolateral 1-0-0, ventral 2-2-0. The metatarsal spines are as long as the tibial spines.

On the fourth leg: femur dorsal 1-1-1, prolateral 0-1-1, elsewhere 0. Patella 0. Tibia dorsal 0-1, prolateral 1-1, retrolateral 1-1, ventral 2-2-2. The length of these spines may be best judged by examination of figure 116 on which they are drawn to scale. Metatarsus dorsal 0, prolateral 1-1-1, retrolateral 1-1-1, ventral apparently 2-2-2, but this is not quite certain on account of the position of the leg in the amber.

The third tarsus is thickly scopulate along its entire length, the third metatarsus in its distal quarter, though a less dense continuation of it may be traced almost to the base. The fourth tarsus is also scopulate along its entire length (figure 112) though not as densely as the third. The fourth metatarsus has no scopula. The surface of the femora is covered with fine, short, recumbent hairs, that of the tibiae

and metatarsi and tarsi with considerably stouter and somewhat longer hair which stands at an angle. Under the second tibia one can see a single row of seven erect hairs. Ungual tufts can be seen on the fourth tarsi. On the third tarsus they have been polished off. Trichobothria may be seen on the fourth tarsi and increase in length distally. The two claws are similar and each has a long row of 10 teeth (figure 114).

Although somewhat shrunken, the abdomen is very well preserved. It is 3.14 mm. long, 1.86 mm. wide, rounded at both ends, but considerably wider in front than behind. The back is densely clothed with short, brown hair. The sides are longitudinally wrinkled, the rows of wrinkles extending from the spinnerets to the genital fold. The trapezoidal field between the wrinkles, occupying the median portion of the venter, is free from wrinkles. The entire venter is densely clothed with short, brown hair.

The spinnerets are well visible in strong light (figure 118) and appear to be cone-shaped. The median pair is not visible. No colulus is present. A circular wrinkle of the integument surrounds the entire mamillary group.

The most characteristic specific feature of the specimen is of course its palpi. Both are well visible in various positions. The femur (figure 115) is considerably wider in front than at its base. Five stout spines can be seen on its dorsal surface. One of these is in the mid-dorsal line, somewhat beyond the middle. The other four form a transverse row close to the end of the femur. A middorsal spine is also present on the patella. The tibia is characterized by the presence of two apophyses (figure 109). One of these is ventral and simple, thorn-like. The other is retrolateral and very peculiar. It has the appearance of a wide scoop, the edge of which is prolonged into a thin process. The scoop arises from the wall of the tibia near its base and has, besides several long bristles, a long, stout spine bent near its base at right angles and directed with its main portion forward (figure 110). The position of the two apophyses is rather unusual inasmuch as tibial apophyses are more commonly apical or subapical. Among amber spiders a similar position of apophyses was described by me in *Eomatachia latifrons*, a cribellated spider of the family Psechridae. The copulatory apparatus is also characteristic. The part inside which the sperm receptacle is situated, is more or less bean-shaped, dark brown, almost black. Between it and the cymbium a curved sheath is situated. This sheath is almost transparent and is evidently for the protection of the embolus which is of the same length as the sheath, but black and needle-like. The sheath is in the shape of a gouge, more or less semicircular in transverse section.

Subfamily SPARIANTHIDINAE

Genus EOSTAIANUS, new

This genus seems to be closely allied to the Oligocene (Baltic Amber) Genus *Eostasina* and the Recent genus *Staianus*. It may be distinguished from the former by having, like *Staianus*, two pairs of ventral spines on the first and second metatarsi, whereas *Eostasina* has three pairs. From the Recent *Staianus* it differs by its anterior median eyes which are as large as the lateral eyes, whereas in *Staianus* they are nearly half the size. The characteristic feature of these genera is the presence of only ventral spines on the first and second tibia and metatarsus, and their length, stoutness and situation on distinctly elevated sockets. The characters of the genus may be given as follows: Carapace longer than wide, convex, highest in the region of the thoracic groove which is longitudinal. Head much narrower than thorax. Eye group nearly as wide as head. Clypeus low. First row of eyes shorter than second row. Eyes of first row contiguous, those of second row evenly spaced and all eyes of about the same size. First coxae wide apart, fourth coxae separated by about half their width. Legs in order 4132. Scopulae wanting. Ventral spines on first and second tibia and metatarsus stout, long and elevated on distinct pedestals. First tibia with three pairs, first metatarsus with two pairs of ventral spines. Type: *E. succini* nov. spec.

EOSTAIANUS SUCCINI spec. nov.

Figures 119-124 and 207

Type. Immature female No. 7997a, complete and well preserved specimen in fairly dark amber. The legs of the right side placed as in prograde spiders, those of the left side, except the first, placed at more or less right angles to the body as in laterigrade spiders. The proportions of the legs are similar to those of Recent *Eusparassidae* and there seems to be no doubt as to the family and subfamily to which the species belongs.

Total length 3.57 mm. Carapace (figure 121) 1.50 mm. long, 1.20 mm. wide between second and third coxae when the specimen is measured in a position in which its ventral surface is in the horizontal plane. Width of head in the eye region 0.65 mm. Width of first row of eyes 0.37 mm., of second row 0.55 mm. Abdomen 2.0 mm. long, 1.3 mm. wide. The face is shown in figure 123, the eye group in figure 119.

Legs	Femur	Pat.+Tibia	Metatarsus	Tarsus	Total
I	1.00	1.55	0.75	0.50	3.80
II	1.10	1.35	0.65	0.50	3.60
III	1.10	1.20	0.80	0.55	3.65
IV	1.30	1.50	1.20	0.55	4.55
Leg formula	4	1	3	2	
	3.0	2.5	2.4	2.4	

Fourth femur curved upward dorso-ventrally, i.e., is concave on the dorsal surface, convex on the ventral surface.

Spines. First leg, femur dorsal 1-1, prolateral 1 stout spine in middle and 1 small and slender spine three quarters from base. Tibia ventral 2-2-2-1p on left leg, 2-2-2 on right leg. In both rows the spines are elevated on little pedestals and the first pair is near base, yet reaches with its end the base of the third pair. The prospines are long and stout, the retrospines slightly shorter and more slender. Metatarsus ventral 2-2. There are no other spines on the first leg. Second leg, femur dorsal 1-1-1, (the third spine very small). Tibia ventral 2-2-1p on right leg, 2-2 on left leg. Metatarsus ventral 2-2. No other spines on second leg. Third leg, femur dorsal 1-1-1 (the third spine small). Patella dorsal 0-1, retrolateral 1. Tibia dorsal 1-1, prolateral 1-1, retrolateral 1-1, ventral 1p-2-1p. Metatarsus dorsal 1-1-2, prolateral 1-0-1, retrolateral 1-0-1, ventral 2-2. No other spines on third leg. Fourth leg, femur dorsal 1-1-1 (the third spine small), retrolateral 0-0-1. Patella dorsal 0-1, retrolateral 1. Tibia dorsal 1-1-1 (the third spine very small), prolateral 1-1, retrolateral 1-1, ventral 0-1r-2 (the first spine stout and long, situated almost in the middle of the tibia, the apical pair small). Metatarsus dorsal 1-1-1, prolateral 1-1-1, retrolateral 1-1-1, ventral 2-2-2 (the five subapical spines forming a verticellum). There are no other spines on the fourth leg.

The ventral spines on all tibiae are stout and long (figure 124). The dorsal spines on all femora are also long, but more slender.

On the palp one can see on the patella 1 dorsal and 1 prolateral spine, on the tibia 1-1 dorsal and 1-1 prolateral spines, on the terminal joint three spines of which one is prolateral, but the position of the other two is uncertain on account of the position of the joint. There is very little and quite inconspicuous hair on the legs, but trichobothria seem to be numerous. Under microscope under fairly high magnification one is able to see that they are irregularly arranged on all tibiae and some may be seen on the metatarsi. The trichobothria are only slightly longer than the hairs and can be recognized only because they arise from the center of a disc-like base. There are no scopulae on any legs. Nor can be any claw tufts seen, although there are only two

claws. They are best seen on the second right leg (figure 120) where a slight dissimilarity is noticeable.

42 Family THOMISIDAE

The classification of this family has been changed several times. Simon recognized six subfamilies. The first two subfamilies he separated from the others on the basis of the structure of their maxillae, pointed in *Aphantochilinae* and *Strophinae*, more or less truncated in others. The *Stiphropodinae* he separated from the other three subfamilies by the swollen tarsi and minute claws. Among the characters by which he separated the *Stephanopsinae* from the last two subfamilies (*Misumeninae* and *Philodrominae*) he mentions the fact that in the former the first pair of legs is the longest, while in the latter two the second leg is the longest. This character applies equally well to all subfamilies because the first leg is longest only in the *Stephanopsinae*. In my own key published in my *Catalogue of American Spiders* in 1939 I recognized seven subfamilies, having removed from the *Misumeninae* all genera possessing true claw-tufts and assigned them to the Subfamily *Dietinae*. But I omitted to mention the relative length of the legs in the key. As an external character unsupported by any evidence of its correlation with internal organs, it has no greater value than the shape of the maxillae or of the tarsi. But this applies to all external characters. On the other hand it seems to be fairly constant. At least in no genus of the *Stephanopsinae* is the second leg longer than the first and only in two genera the two pairs seem to be of the same length. Moreover, it is a very convenient character, especially in fossil species. For all these reasons I believe it advisable to segregate in the Subfamily *Stephanopsinae* all Recent and fossil genera of *Thomisidae* in which the first leg is longer (or at least not shorter) than the second. With this character as the chief basis for the separation of the Subfamily *Stephanopsinae* the status of Koch's genus *Syphax* must also be changed. In 1942 I placed it in the Subfamily *Dietinae* on the strength of the presence of claw-tufts. The genera of fossil *Thomisidae*, *Facundia*, *Filiola* and *Medela*, placed by me in 1942 in the Subfamily *Misumeninae* because of the lack of claw tufts must be also reconsidered in this connection. In *Facundia* the first leg is much the longest and the genus should be therefore regarded as belonging to the Subfamily *Stephanopsinae*. In *Filiola* and *Medela* the fourth leg is clearly the longest. This is a very unusual thing. So far as I am aware the fourth leg among Recent *Thomisidae* is the longest only in the genera *Aphantochilus*, *Thanatus* and *Tibellus*.

In the genus *Bucranium*, according to its author O. P. Cambridge, the first and fourth legs are subequal in length (exact measurements in *Bucranium taurifrons*, the genotype and only species, are not given), while in the genus *Majella* also belonging to the Subfamily Aphantochilinae the first leg is the longest in the two known species. In these two Recent genera the maxillae are pointed, but their shape in the fossil *Filiola* and *Medela* is not known because in the specimens on which I based these genera the maxillae are obstructed from view by dirt and emulsion. Among the Thomisidae described below *Eoathanatus* has also the fourth leg longest, but its maxillae are not visible. Since there is no evidence whatsoever that *Filiola* and *Medela* are in any way related to either *Aphantochilus*, *Thanatus* or *Tibellus*, it may be wisest to leave them *incertae sedis* within the Family Thomisidae. Koch described four Baltic Amber species of *Philodromus*, but Menge considered them to be *Pythonissa*, a genus synonymous with *Gnaphosa* of the Family Drassodidae (= *Gnaphosidae*). Menge himself established a Baltic Amber genus *Anatone* differing from *Philodromus* only by the relative size of the eyes. Neither the proportion of the legs of the two species of *Anatone* nor their maxillae are mentioned. The following key to Baltic amber Thomisidae is therefore applicable only to genera recognized and described by me. I may add that the spider which in 1942 I placed in the genus *Misumena* (a Recent genus, with many common species in all parts of the world) has great resemblance to *Fiducia tenuipes* described below, but the order of legs and the shape of the sternum is different. Already at that time I expressed the opinion that "it is possible that the amber species *M. samlandica* should be separated from the recent species and a new genus erected for it. But in that case the definition of the Genus *Misumena* would have to be revised and that does not seem to be desirable." (p. 375.) I still hold this opinion.

Key to Baltic amber Thomisidae

- 1. The first and second pair of legs are considerably longer than the third and fourth pair. 2
 - The fourth pair is distinctly the longest. 5
- 2. The second pair of legs is the longest. Spines and claw tufts wanting.
 - Genus *Misumena*
 - The first and second pair of legs are equally long or the first pair is longer. . . 3
- 3. The first and second pair of legs are equally long, stout, with stout spines. Claw tufts well developed. Sternum shield-shaped, longer than wide. Hair simple. Genus *Syphax*
 - The first leg is distinctly longer than the second. Claw tufts wanting. . . 4

4. Legs relatively short and stout, the first leg not more than two and one-quarter times as long as the carapace. Anterior median eyes much smaller than anterior lateral eyes. Sternum suborbicular. Genus *Facundia*
- Legs slender, first leg nearly six times as long as carapace. Eyes of first row equal. Sternum triangular. Genus *Fiducia*
5. Eyes of first row much smaller than those of second row. Patella of all legs with strongly angular retrolateral edge. Claw tufts wanting. Integument with simple hair. Genus *Medela*
- Disparity in the size of the eyes not great. Patella of the usual appearance. 6
6. Claw tufts wanting. Hair simple. Clypeus as high as the quadrangle. Eyes on a low, transversely elliptic tubercle. Genus *Filiola*
- Claw tufts present, although poorly developed. Hair with a pair of basal pinnae. Clypeus much lower than the quadrangle. Eyes not on a tubercle. Genus *Eothanatus*

Subfamily STEPHANOPSINAE

Genus *SYPHAX* Koch and Berendt 1854Type *S. megacephalus* K. and B.*SYPHAX ASPER* spec. nov.

Figures 128-130 and 212

Type, No. 7661, Mus. Comp. Zoöl. Immature female. Figure 212. Total length with chelicerae 4.15 mm. Carapace 1.70 mm. long, 1.60 mm. wide, about 0.90 mm. wide in the region of the eyes. Abdomen 2.40 mm. long, 2.25 mm. wide, evenly rounded at both ends and on sides, flattened above.

Legs	Femur	Pat. +Tibia	Metatarsus	Tarsus	Total
I	1.40	1.70	0.65	0.55	4.30
II	1.25	1.50	0.55	0.45	3.75
III	0.90	1.00	0.45	0.45	2.80
IV	1.10	1.10	0.55	0.45	3.20
Leg formula	1	2	4	3	
	2.5	2.2	1.9	1.6	

(NB. In *Syphax crassipes* the length of the second leg is given as equal to that of the first leg and the order of legs the same as in *S. asper*. The reason for this was that in actual measurement the first leg showed a slightly greater length in the third decimal which was omitted in the table.)

The general appearance of *S. asper* is more or less the same as that of *S. crassipes* and is shown photographically in figure 212. The carapace of the type of *S. asper* has a longitudinal tear on the right side

and the head is very dark. The shape of the carapace is easily seen in a complete outline, but the eye group cannot be seen either in reflected or in transmitted light. Only by turning the specimen around one can see in certain positions a row of four eyes, but it is impossible to decide whether it is the first or the second row and the size of the eyes can be only approximately gauged, not measured. The surface of the carapace is sparsely clothed with the same type of hair as on the back of the abdomen.

The chelicerae are stout and short, almost black in color, but their structure cannot be studied on account of the imperfections of the amber, preventing a clear view. On the other hand the lip and maxillae (figure 129) are plainly visible both in reflected and in transmitted light so that it was possible to make a drawing under microscope. The structure of the lip is very different from that of *S. crassipes* inasmuch as it has lateral excavations lacking in the latter species and is distinctly wider than long, instead of being longer than wide. The sternum is also very well visible and is longer than wide in the ratio 17 : 14. It has the same shape as in *S. crassipes*, except that the anterior excavation is gently procurved and not straight. The posterior end is pointed. The surface is sparsely clothed with short, simple hair of the same type as on the venter of the abdomen. The first coxae are wide apart, the fourth coxae are separated by about half their width.

As in *S. crassipes*, only the anterior pair of spinnerets can be seen and even these not too clearly. The group of spinnerets is situated just enough in front of the posterior edge of the abdomen to make them visible only from below. The distinctive feature of the abdomen is the appearance of its dorsal wall and the structure of its hair when examined under high power in transmitted light (figure 130). One sees then that the entire surface is covered with fine, wavy lines running in all directions. The hair is of two kinds, both sticking out obliquely above the surface and having under low power in reflected light the appearance of short rods. Under high power in transmitted light one notices at once the difference in the two types. The more numerous hair is lancet shaped and has minute spikelets on each edge. The base of the lancet is in the center of a flat, brown ring. The second type is simple hair of about the same length as the other type, but much more slender and lacking the basal ring.

The legs are stout, dark brown and have a rough appearance due to the stout hair which is simple on the femora, but covered along its full length with at least four rows of minute spikelets. There are also distinct spines present. On the femur of the first leg 1-1-1 pro-lateral spines, the first of which is in middle; tibia dorsal 1-1, mid-

ventral 1-1-1-1-1; metatarsus midventral 1-1-1. On the second femur 1-1 small dorsal spines on the left leg only; tibia dorsal 1-1, ventral 1p-1p-1p; metatarsus 1p-1p. On the third leg patella dorsal 1-1; tibia dorsal 1 in middle. On the fourth leg patella dorsal 1-0; tibia dorsal 1 at base. No other spines can be seen on any leg.

Two claws (figure 128), similar, stout, strongly curved, with a row of about eighteen teeth increasing in length distally. The claw tufts are well developed and composed of numerous tenent hairs, each supplied with spikelets standing at right angles to the hair along the entire edge on each side.

Genus FIDUCIA, new

Legs laterigrade, the first two pairs considerably longer than the last two pairs. The first pair much longer than the second pair. All legs slender. Carapace very little longer than wide. Head narrow, clypeus high. Sternum triangular. First coxae very wide apart. Hair simple, setose. Claw tufts and scopulae wanting. Claws two, similar, with five teeth. Baltic amber. Type *F. tenuipes* spec. nov.

FIDUCIA TENUIPES spec. nov.

Figures 138-141, 210 and 211

The Museum of Comparative Zoölogy has four specimens of this species, three of them females presumably in the penultimate instar, one a male in the penultimate instar. All four have the same appearance and resemble *Misumena samlandica* from which, however, the species can be distinguished by the relative length of the legs and by the eye group.

Type. Specimen No. 7751a. Figure 210. Total length with chelicerae about 2.75 mm., but exact measurement is not possible partly because of the heavy emulsion covering the abdomen, partly because of the twisted position of the cephalothorax. Carapace 1.0 mm. long, 0.95 mm. wide. Head 0.60 mm. wide in the region of the lateral posterior eyes, i.e. where the head joins the thorax. Width of eye group 0.45 mm. Abdomen ca. 1.55 mm. long, 1.65 mm. wide.

Legs	Femur	Pat.+Tibia	Metatarsus	Tarsus	Total
I	1.60	1.85	1.25	0.75	5.45
II	1.30	1.30	1.00	0.65	4.25
III	0.90	0.85	0.70	0.45	2.90
IV	1.25	1.25	0.85	0.50	3.85
Leg formula	1	2	4	3	
	5.4	4.2	3.8	2.9	

The eye group is shown in figure 138. The anterior row of eyes is recurved, the posterior row procurved and longer than the anterior row. Although plainly visible the eyes are difficult to measure. The anterior eyes are of about the same size and more or less evenly spaced. The posterior eyes are somewhat larger and also more or less evenly spaced. The lateral eyes are separated by about the radius of the anterior lateral eyes. The clypeus is strongly inclined and as high as three quarters of the length of the quadrangle which is narrower in front than behind and as long as wide.

The chelicerae are vertical, with parallel outer edges. Their first joint is 0.32 mm. long, the fang is slender and gently curved. The margins are not visible on account of the emulsion.

There are no spines on the legs, but one can see 1-1 dorsal bristles on the patellae and either 1-1 or 0-1 similar bristles on the tibiae. They are somewhat stouter and longer than the setose hair with which the legs are clothed. Claw tufts and scopulae are wanting. The claws (figure 141) are similar, with five teeth. The entire ventral surface of the body is heavily coated with white emulsion. The dorsal surface of the abdomen is also heavily coated, but the stout bristles with which it is clothed and some of which reach the length of 0.65 mm. stick out above the emulsion.

Paratype, specimen No. 7192, immature female. Total length with chelicerae in the position of the spider in the amber 2.5 mm., but actual length must be greater because of the considerable angle at which the cephalothorax is placed in respect to the abdomen. Nor can the carapace be measured, although the specimen is clear of emulsion. The eyes can be seen, but with some difficulty. The eye group is the same as in the type and the clypeus is plainly visible. On the promargin of the chelicerae one can see two teeth of which the proximal one is considerably larger than the distal one (figure 140). No teeth can be seen on the retromargin, but the view is not sufficiently clear to be certain in this regard. The legs are much as in the type in appearance and their proportions are as follows:

Legs	Femur	Pat.+Tibia	Metatarsus	Tarsus	Total
I	1.75	2.10	1.55	0.75	6.15
II	1.55	1.60	1.20	0.65	5.00
III	0.90	0.95	0.75	0.55	3.15
IV	1.20	1.35	1.05	0.55	4.15

Paratype, specimen No. 7432, immature female. Total length with chelicerae 2.7 mm. The specimen is badly damaged and although clear, cannot be measured exactly except its legs and sternum. The

latter is shown in figure 139. It is triangular, 0.65 mm. long, 0.65 mm. wide. The lip is trapeze-shaped. The first coxae are wide apart, the fourth coxae are separated by more than their width, though that may be due to the damaged condition. The legs have the same appearance as in the other two specimens.

Legs	Femur	Pat. +Tibia	Metatarsus	Tarsus	Total
I	1.95	2.15	1.50	0.75	6.35
II	1.50	1.55	1.30	0.70	5.05
III	0.90	0.90	0.80	0.55	3.15
IV	1.25	1.35	1.05	0.55	4.20

At the end of the left palp one can see a claw with a single tooth. Some of the hair on the tibiae and metatarsi stands at right angles, but it is not possible to decide whether it is due to accident or to a different type.

Specimen No. 7704 (figure 211), immature male in the penultimate instar. Total length 3.25 mm. I refer this specimen with hesitation to the same species as the above three females. Its legs, while of the same type, seem to be somewhat stouter and in front of its palpi one can see two viscous threads of silk with a row of droplets. This silk may be there by a pure coincidence; Thomisidae do not produce viscous silk; but the appearance of the spider may be misleading and it may not belong into this family at all. The ventral surface is clear of emulsion and is shown in figure 211 photographically. The dorsal surface is not only coated with white emulsion, but a very large bubble with white walls prevents the view of the carapace except for the two lateral eyes on the right side, and the posterior edge of the carapace on the left side. The appearance of the visible portions of the carapace suggests that the spider was in the process of moulting.

Legs	Femur	Pat. +Tibia	Metatarsus	Tarsus	Total
I	1.40	1.50	1.00	0.75	4.65
II	1.15	1.25	0.80	0.60	3.80
III	0.85	0.75	0.60	0.45	2.65
IV	0.95	1.00	0.75	0.50	3.15

The bristles and hair on the legs are of the same type as in the females. The claws are not well visible, but seem to be more or less also of the same type. There are definitely shorter erect hairs on tibiae and metatarsi at fairly great intervals between the longer, inclined hairs which are much more numerous.

The chelicerae and fangs are plainly visible from below, but the

view of the margins is obstructed by emulsion. Similarly the end of the lip is covered with white emulsion so that it is not possible to say whether the lip is trapeze-shaped or triangular. The sternum is triangular, as long as wide and distinctly convex. The first coxae are very wide apart. The fourth coxae are somewhat displaced, but seem to be separated by their width. The abdomen is turned on its side, so that the spinnerets appear on the edge, on the right of the observer (actually the left of the spider). This position prevents careful study of the spinning group. The spinnerets are cone-shaped, the anterior pair somewhat longer and stouter than the posterior pair. The median pair is not visible. Between the anterior pair a colulus is present.

Subfamily PHILODROMINAE

Genus EOTHANATUS, new

This genus is closely related to the Recent genus *Thanatus* from which it may be distinguished by the (probable) order of the legs, the shorter length of the second row of eyes, the lesser development of the unguis tufts, the structure of the hair on the abdomen and the absence of bristles. Type *E. diritatis* spec. nov.

EOTHANATUS DIRITATIS spec. nov.

Figures 131-137, 213

Type, specimen No. 7441. Mature male. A rather poorly preserved and badly mishandled specimen (figures 131 and 213). The metatarsus and tarsus of the first right leg are cut off and the first left leg is completely missing making the measurements of the legs incomplete. Yet the first femur and tibia with patella are longer than the second and shorter than the fourth, making it highly probable that the order of legs is 4123, (whereas in *Thanatus* it is 4213). The abdomen is cut away about its middle and its ventral wall is also missing. Fortunately it is a male and the loss of the ventral surface does not affect the distinctive specific characters, but the spinnerets are completely missing. The total length of the specimen can be therefore only guessed approximately as having been ca.2.5 mm. Carapace 1.15 mm. long, 1.50 mm. wide (figure 131). Eyes in two rows, very difficult to see, but it is certain that the second row is not much longer than the first, as is the case in *Thanatus*. The clypeus seems to be quite low. In front view, figure 132, one can see a bristle between the posterior

median eyes and four more slender bristles in the first row as shown in the figure. The chelicerae are stout and short. The boss is clearly visible, the margins are oblique and somewhat concave. The armature of the margins cannot be seen. The sternum is shown in figure 135. It is about as wide as long, but its anterior edge is partly hidden by white emulsion. Posteriorly the sternum is drawn out into a small projection which separates the fourth coxae. The first coxae are almost as wide apart as the second pair. The legs are apparently laterigrade and all joints are cylindrical.

Legs	Femur	Pat.+Tibia	Metatarsus	Tarsus	Total
I	1.70	2.20	—	—	—
II	1.60	2.00	1.15	0.90	5.65
III	1.50	1.85	1.30	0.75	5.40
IV	1.85	2.25	2.05	1.00	7.17

All spines are short and slender. One can see on the femora of all legs 1-1 dorsal spines, on the third and fourth tibia 2-2-2 ventral spines and on the metatarsi 1-0 ventral spines. Apparently there are no other spines present. The claws are poorly visible. Only on the second left tarsus they can be studied under higher power and are shown in figure 137. The claw tufts are rather poorly developed and, under lower power almost escape observation on account of their resemblance to hair. All hair on legs is simple. On the abdomen, on the other hand, the hair is provided with a pair of lateral pinnae situated near the base (figure 136). In *Thanatus*, at least in the American species *T. coloradensis*, the abdominal hair has several pairs of similar pinnae. Another difference in the structure of the abdominal hair in these two related genera is in the manner in which the pinnae arise from the main stem. In *Eoathanatus* the main stem is smooth, but in the Recent *Thanatus* it has a little shelf for the base of each pinna and the shelves extend far beyond the last pair of pinnae, so that if each available shelf had a corresponding pinna, the entire hair would be a plume. Both palpi are visible. The left palp is shown complete as viewed from its prolateral side (figure 133). It shows clearly that the femur is distinctly curved dorso-ventrally. Of the copulatory apparatus one can see the bulb and two processes arising from it. The basal one is much stouter, black, and resembles a spine or thorn. I think it is the conductor. The distal one is very thin and is probably the embolus. The right palp is figured from above to show the apical, retro-lateral apophysis of the tibia. This apophysis appears to be straight in any position. (Figure 134.)

An unusual and interesting feature of the specimen is the preser-

vation of the hypodermis underlying the dorsal chitinous wall of the abdomen (figure 176). Examining it under high power one can see that the hypodermal cells are still individually preserved, but sufficiently contracted to leave a little space between each cell. Within each cell a dark body is visible, which can be interpreted only as the nucleus of the cell. It is the nucleus which is also visible at the base of each hair in places where the rest of the hypodermis has disintegrated. I have shown this in figure 136. In some cases one can even see that the nucleus is somewhat behind the socket on which the hair sits and which is more refractive, being chitinous.

47 Family CLUBIONIDAE

Genus *ABLIGURITOR* Petrunkevitch 1942

Type *A. niger* Petrunkevitch

ABLIGURITOR PLUMOSUS spec. nov.

Figures 142-148, 178 and 204

Type, No. 7624, M.C.Z. Immature female. Figure 204.

Total length with chelicerae 2.8 mm. Carapace 1.02 mm. long, 0.95 mm. wide. Head 0.50 mm. wide, anteriorly with parallel sides which then begin to converge posteriorly in a curve and meet approximately in the center of the almost circular thoracic portion. In the median line the head is on a level with the median line of the thorax and the entire carapace is rather flat. The converging cephalothoracic sulci are shallow and appear as fine transparent lines. The eye group is considerably narrower than the head, but the individual eyes are extremely difficult to see and the drawing of their disposition (figure 148) is the result of prolonged and tedious study and not a drawing under the camera lucida as the rest of the figure. In life the surface of the carapace must have been clothed with plumoso-lanceolate hair of the same type as on the abdomen and on the legs, since one can see four such hairs. But it must have been rubbed off before the spider was caught in the liquid resin so that but for the four hairs mentioned the rest of the surface is glabrous.

The chelicerae are stout and short, directed obliquely downward, but since they can be seen only from above, nothing more can be said about them. The sterno-coxal region is so full of dirt and partly concealed by emulsion, that it cannot be studied. One thing is certain

that the first coxae are very wide apart. The fourth coxae seem to be separated by their width. Judging by a portion of the sternum which is not concealed by dirt, the sternum is very slightly convex. The abdomen is ellipsoidal, 1.70 mm. long, 1.15 mm. wide. Its dorsal surface is more or less thickly clothed with hair of unusual structure which may be called plumoso-lanceolate (figure 147). The shaft of each hair is flat, lanceolate; from three to five barbs can be seen on each hair in its proximal half. In some of the hairs longitudinal lines can be seen, running parallel to the edge of the shaft. The ventral surface of the abdomen is sparsely clothed with simple hair only. The spinnerets cannot be seen on account of dirt.

All legs are present and complete, but the left second and third legs were evidently severed while the creature struggled to free itself from the sticky resin and now lie in front of the chelicerae. An interesting feature of the legs is the preservation of most muscles which appear as very dark brown rods now lying free in the cavity of each joint.

Legs	Femur	Pat.+Tibia	Metatarsus	Tarsus	Total
I	0.84	1.13	0.54	0.36	2.87
II	1.08	1.50	0.75	0.60	3.93
III	0.90	1.13	0.66	0.60	3.29
IV	1.29	1.62	1.20	0.66	4.77
Leg formula	4	2	3	1	
	4.7	3.8	3.2	2.8	

The spines are very difficult to see on account of their color, much like that of the surrounding amber. Even the large ventral spines of the anterior four legs can be well seen only under high power in transmitted light. On the femur of the first right leg one can see 1-1-1 dorsal spines and since at least one spine can be seen on all other femora it seems probable that their number is the same. On the first tibia 2-2-2-2 ventral spines are present (figure 143). They are stout, long and distinctly curved, each reaching beyond the base of the following one. On the first metatarsus only one pair of stout, straight and long spines are present (figure 144). The second metatarsus is armed in a similar manner, but the second tibia differs from the first tibia in that it has three spines more and the spines are still longer and straight (figure 145). This gives the second tibia 1p-2-2-2-2 ventral spines as in *A. niger* and the first spine stands out at right angles, but all spines are stout and long and reach far beyond the base of the following one. On the third tibia one can see a single proventral spine on the right leg, but on the fourth tibia 1-0-1 small proventral spines are visible and on the fourth metatarsus 1-1-0 similar small proventral spines are present.

The claws are strongly curved and slightly dissimilar. Under the claws (figure 142) from four to six tenent hairs are in plain view. A row of about six very long trichobothria can be seen on the metatarsi and tarsi. The legs are clothed with the same type of plumosolanceolate hairs as the body. Only on the tarsi they become almost completely displaced by simple hair.

This species can be separated from the type by its much longer ventral tibial and metatarsal spines of the first two pairs of legs and by the type of its hair. In *A. niger* the abdomen is clothed with scales.

49 Family SALTICIDAE

This family is represented in the collection of the Museum of Comparative Zoölogy by two species.

GORGOPIS FRENATA (Koch and Berendt)

Figure 149

Phidippus frenatus Koch and Berendt, 1854.

Gorgopsis frenata Petrunkevitch, 1942, pp. 407-417, figs. 8-11, 20-32, 517-521.

Five young specimens of indeterminable sex, one immature male in the penultimate instar and two mature males. The latter are both typical and both show the palpi clearly. But specimen 7269 (113) is especially interesting because the embolus and the conductor are separated, both clearly visible (figure 149), whereas in the hypotype of the British Museum they are completely in contact with each other. Specimen 7269 is almost complete. Only the left first and the right third leg are missing. The total length can be measured only approximately, because the abdomen lies at an angle to the cephalothorax and normally overlaps it in this species. Measured in a direct line from the vertex of the AME to the tip of the spinnerets the length is 4.57 mm. The carapace is 2.10 mm. long, 1.15 mm. wide in its widest place, but only 0.85 mm. in the region of the greatest constriction. The abdomen is 2.43 mm. long and rather thin, tapering gradually from in front backward.

Legs	Femur	Pat.+Tibia	Metatarsus	Tarsus	Total
I	1.50	1.90	1.30	0.65	5.35
II	1.30	1.40	0.95	0.65	4.30
III	1.00	1.30	1.00	0.65	3.95
IV	1.35	1.85	1.20	0.65	5.05
Leg formula	1	4	2	3	
	2.5	2.4	2.0	1.9	

The spines are well preserved, but the hair seems to have been rubbed off in many places.

EOLINUS THERYI Petrunkevitch, 1942, p. 428

Figures 214-215

The type of this interesting species is in the British Museum. The Museum of Comparative Zoölogy has six specimens which I refer to this species. Specimen No. 7284 is a mature male, specimens 7276 and 7324 are immature females, specimen 7183 is a beautifully preserved carapace of an exuvium. One specimen is a very young spiderling with the eye group clearly visible. The last specimen is a damaged one with the eye group not fully preserved and its specific affiliation for this reason not absolutely certain. The two immature females are the most interesting specimens of the lot. Specimen No. 7276 has its four left legs fully extended, giving a clear picture of their relative length (figure 215). In specimen 7324 (figure 214) the dorsal surface of the carapace and abdomen is better preserved than in any other specimen and its integument is densely clothed with hair. The eye group of both these specimens is perfectly preserved and can be studied without any difficulty.

50 Family SEGESTRIIDAE

Genus SEGESTRIA Latreille 1804

Type *S. florentina* (Rossi)

The genus *Segestria* is widely distributed and is represented on all continents. At least six Recent species occur in Europe. Nine species have been described from the Baltic amber. Of these Koch described *S. cylindrica*, *S. elongata*, *S. nana* and *S. tomentosa*; Menge mentioned *S. cristata*, *S. exarata*, *S. pusilla* and *S. undulata*; Berland described *S. succinei*. In 1942 I was tempted to call Menge's species *nomina nuda* because of the extreme brevity of description, in each case reduced to less than a line, and the lack of drawings. Greater acquaintance with amber material makes me revise that opinion because Menge seems to have based his species on the most distinctive characters. It seems to me furthermore, that Berland's *S. succinei* on closer examination may prove to be a synonym of Menge's *S. cristata*, since both these species are stated to have a crest of bristles in the median

long, 1.29 mm. wide. Three pairs of legs directed forward. The margins of the chelicerae are unfortunately obstructed from view by the palpi, and the spinnerets are somewhat coated with white emulsion, so nothing new can be added to my original description of the species.

Specimen No. 7180 is considerably smaller, being only 3.2 mm. long. It is complete and rather dark in color.

Specimen No. 6784 is an exuvium, complete but for the loss of the first left leg and partial loss of the second, third and fourth left legs. In all other respects the specimen is perfect and can be studied and measured without difficulty. The abdomen, of course, is shrivelled, as is the case in all exuvia of Recent spiders, unless they are immediately preserved in weak alcohol. The specimen is shown photographically in figures 169-172. It is in many respects an important and interesting specimen. The margins of the chelicerae are plainly visible. The promargin (figure 157) is provided only with a scopula. The retromargin (figure 156) has no scopula, but is armed with two teeth, the proximal of which is by far the largest. The sternum (figure 158) is typical of the genus inasmuch as it is provided with four pointed spurs on each side for the articulation with the coxae as shown in figure 159. The maxillae and lip are also plainly visible and typical of *Segestria*. But the most interesting features of the exuvium are: 1) the presence of the complete foregut (figure 172) normally shed by spiders at each molt, but easily lost when the exuvium dries up; 2) the presence on the first right leg beyond the tibia of a single joint without claws (figure 170), instead of two joints with claws, showing that the spider was able to regenerate an injured leg without autotomizing it; and 3) the discrepancy in the size of the lenses of the two anterior lateral eyes, an unusual monstrosity presumably badly affecting clear vision (figure 171).

Specimen No. 6789 is a much less perfectly preserved exuvium.

SEGESTRIA PLICATA spec. nov.

Figures 150-155, and 173

The M.C.Z. has four specimens of this species, one of which is apparently a mature female and the others immature specimens of varying age.

Type, specimen No. 7436, mature female. Figures 150-154 and 173.

Total length in the position in which the spider lies in the amber 7.15 mm. Presumably the real length is slightly smaller, because the abdomen is severed from the carapace and is separated from it by 0.5 mm. The spider lies on its right side and is unfortunately not

complete. The end of the right palp is present, but the middle evidently cut off by polishing. Similarly, the first and second pair of legs are incomplete due to the same cause. The carapace is partly obstructed by the legs, but can be measured exactly even though it can be drawn only in side view. The carapace is 3.14 mm. long, 2.35 mm. wide and 0.86 mm. high at the highest point which is situated three quarters of the length of the carapace behind its anterior end. The shape of the carapace may be best understood from figure 150. It slopes forward very gently in an almost straight line, while the posterior declivity is quite steep. Figures 152 and 153 show the cephalothorax in rear view and the posterior edge of the carapace. The eye group is shown in figure 154. It is very troublesome to study on account of the legs partly obstructing the view so that a drawing from above cannot be made. But one can see the left lateral eyes in side view and one can measure individual eyes fairly accurately. The ratio of the eyes is AME : ALE : PLE = 4 : 8 : 5. The anterior median eyes are almost, but not quite in contact and their axes are slightly, but distinctly converging. The anterior lateral eyes are considerably larger, are separated from the anterior median eyes by a little less than the diameter of the latter and are directed almost straight forward. Viewed from in front as in figure 154, the anterior row of eyes is very gently down-curved, and the clypeus under the anterior median eyes is just a little higher than their diameter (5 : 4). The posterior lateral eyes are directed backward, outward and upward and are situated, as the figure shows, on a common tubercle with the anterior lateral eye on each side of the head. The tubercle is as high as the diameter of the anterior lateral eye and its dorsal surface is evenly curved. It has therefore the shape of a cone lying on its side. The surface of the carapace is clothed with very short hair. The chelicerae are evenly attenuated from base to articulation of the fang and are 1.55 mm. long. Their front surface is clothed with slender bristles. The maxillae are long. The lip cannot be seen.

Legs	Femur	Pat.+Tibia	Metatarsus	Tarsus	Total
I	2.71	—	—	—	—
II	2.71	3.29	—	—	—
III	2.43	2.86	1.71	0.86	7.86
IV	3.14	3.43	2.00	1.00	9.57
Palp	1.10	1.05		1.00	3.15

It is evident from the relative length of the femora that the fourth leg is the longest.

The spines are shorter and stouter than in *S. elongata*. First leg, femur dorsal 1-1-0, tibia prolateral 1-1; second leg, femur dorsal

1-1-0 on left leg, 1-1-2 on right leg, tibia retrolateral 1-1-1; third leg, femur dorsal 1-1-0, tibia prolateral 0-1-1, retrolateral 0-1-1, ventral 0-1p-2, metatarsus ventral 2-0; fourth leg, femur dorsal 1-1-1-1 in proximal half, retrolateral 1 about one fifth from end, tibia ventral 2-2-2-2, metatarsus ventral 2-2, the distal pair very short. No other spines on legs.

The claws are shown in figure 151. They are similar and have seven long teeth. The third claw has a long, single tooth. Serrated bristles and scopulae are wanting. The palpal claw is smooth. The abdomen is 4.14 mm. long to base of spinnerets and 2.57 mm. wide. Its height is only 2.30 mm., which means that it is somewhat flattened below, because its dorsal surface is rounded. The most characteristic feature of the abdomen is the presence of longitudinal wrinkles on the sides, merging with the opposite side wrinkles in the posterior quarter of the abdomen where they are visible on the dorsal surface. Figure 150. The anterior three quarters of the dorsal surface are quite free of wrinkles.

The surface of the abdomen is clothed with very short hair, while the hair on the legs varies in thickness.

On the same slide with the above described spider there is in the amber an exuvium of a much smaller spider with six stout and long ventral spines on the first tibia having apparently the disposition 2-1p-2-1p. On the second tibia there are 2-2-1p ventral spines. The species cannot be identified because important structures are broken off, but the spines remind one of *Eostaianus succini*. If it is so, then it was a very young spiderling. The most interesting feature of the exuvium is the excellent preservation of the pharynx.

Specimen No. 8500 is only 2.9 mm. long with a carapace 1.15 mm. long. The width of the carapace cannot be measured. The abdomen is clothed with rather coarse, bristly hair which would make one doubt that it belongs to the same species were it not for the plainly visible wrinkles which have the same position and appearance as in the type. The order of the legs is 4123.

Legs	Femur	Pat. +Tibia	Metatarsus	Tarsus	Total
I	1.00	1.25	0.65	0.40	3.30
II	0.85	1.00	0.65	0.35	2.85
III	0.80	0.80	0.65	0.35	2.60
IV	1.15	1.35	0.85	0.40	3.75

Specimen No. 7174 is still smaller. It lies with its ventral surface up on a thin sheet of black dirt. The dorsal surface is visible when the slide is turned upside down. Total length 1.75 mm. Carapace

1.10 mm. long, its width cannot be measured. Of the eyes only one pair is visible, presumably the anterior median eyes almost in contact with each other. The surface of the carapace and of the abdomen seem to be glabrous, but the wrinkles on the sides of the latter are plainly visible and cross the dorsal surface in its posterior quarter. The sternum appears to be rather convex, but has the appearance of having been changed in its shape by internal pressure of gas filling the body. The order of the legs is 4123.

Legs	Femur	Pat.+Tibia	Metatarsus	Tarsus	Total
I	0.70	0.70	0.50	0.30	2.20
II	0.65	0.70	0.50	0.30	2.15
III	0.55	0.60	0.45	0.25	1.85
IV	0.75	0.85	0.85	0.30	2.75

Specimen No. 9761 I refer to this species with reservation. It is complete and well preserved, but lies on its left side on an uneven sheet of crumpled amber inside of otherwise clear amber. Its ventral surface is partly exposed on the other side of the crumpled sheet, which shows also the spinnerets in side view. The abdomen is clothed with more or less erect, curved, bristly hair. The view of the eyes is badly obstructed by the legs, but all six eyes appear to be of the same size. The clypeus cannot be measured, but seems to be about equal to the diameter of the anterior median eyes. The spinnerets (figure 155) are of somewhat different length and diameter, the posterior pair being more slender and longer. At the end of the posterior spinneret two small spinning tubes and between them a single spigot are visible. The total size of the spider measured in the position in which it lies in the amber is 2.57 mm. and it is therefore certain that it is somewhat greater than the measurement. The carapace cannot be measured. The abdomen is 1.6 mm. long and 0.80 mm. high. Its width cannot be measured. Its sides are with faint indications of longitudinal wrinkles resembling those of the other three specimens. The second and third legs cannot be measured exactly beyond their tibia, because their metatarsus and tarsus are placed at a considerable angle to the surface of the piece and the refraction becomes too great when the specimen is inclined. But it is quite certain that they are not longer, and probably slightly shorter than those of the first leg. It is therefore also certain that the order of legs is 4123.

Legs	Femur	Pat.+Tibia	Metatarsus	Tarsus	Total
I	0.85	0.95	0.55	0.35	2.70
II	0.75	0.85	?	?	?
III	0.67	0.67	?	?	?
IV	0.90	0.95	0.55	0.40	2.80

The sternum is plainly visible in a three quarter view. Its left edge shows the typical, thorn-like projections for the articulation of the coxae. Its surface is convex and sparsely clothed with curved, bristly hairs. The lip is much longer than wide, with almost parallel sides and lateral basal excavations, just as in *S. elongata*, and the maxillae have the same shape.

51 Family DYSDERIDAE

Genus *HARPACTES* Templeton 1834

Type *Aranea hombergi* Scopoli

HARPACTES *EXTINCTUS* spec. nov.

Figures 160-167, and 177 and 181

Type, No. 8241, immature female.

A single, badly mishandled specimen (figure 181). A piece of the abdominal roof had been polished off and a channel drilled from one side to the abdominal cavity and then left with polishing powder partly filling it. It was necessary for purposes of study to remove this powder and the air as far as that was possible, to cut the surrounding amber sufficiently near to the specimen to permit examination under a 16 mm. apochromat with oculars up to X30. The position of the specimen in the amber is such that many structures can be seen only in certain positions and then only with the aid of special lighting. When the specimen was finally mounted on a slide after completion of the study, many of the details shown in the figures became again invisible. They could be seen, however, if this became absolutely necessary, by removing the specimen, cleaning it of clarite and studying it in mineral oil.

Total length without chelicerae 4.45 mm. Carapace 1.40 mm. long, 0.90 mm. wide, of the shape shown in figure 161. In side-view the carapace appears to be rather low (figure 166) and without any demarcation between the head and the thorax. The eye group (figure 162) is compact and small. It is composed of six eyes, the anterior pair slightly, but distinctly larger than the others, and all six forming a somewhat elongated, transverse ellipse. The clypeus is not greater than the diameter of an anterior eye and possibly not more than its radius but very difficult to see properly and cannot be measured. White emulsion somewhat obstructs the view of the ventral surface, the inner

edge of the maxillae is not clearly outlined and the lip is altogether invisible. With proper illumination one obtains a picture as that shown in figure 167. The sternum is almost triangular and the first coxae are wide apart, while the fourth coxae are subcontiguous. The sternum cannot be measured exactly because of the white emulsion at its edge between the anterior coxae, but it seems to be about as wide as long. Laterally it has only two prolongations on each side (or possibly three, if there is one between the maxillae and the first coxae, a feature which cannot be ascertained in any position of the specimen). The space between the second and third coxae on each side is greater than the space between either the first and second or the third and fourth. The edge of the sternum is clearly visible from its last lateral projection to the posterior end and is quite straight. The chelicerae are much shorter than in species of the genus *Dysdera*. The left chelicera is shown in its promarginal view in figure 160. There are two minute teeth at the proximal end of the promargin, while the retromargin is with a row of small bristles occupying almost the entire length of the basal segment. The fang is less than half as long as the basal joint and is evenly and rather gently curved. The lateral view of the right maxilla with the palp is shown in figure 165. All legs are well preserved and can be easily measured.

Legs	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
I	1.10	0.65	0.95	0.75	0.30	3.75
II	1.05	0.60	0.85	0.75	0.30	3.55
III	0.90	0.40	0.60	0.75	0.30	2.95
IV	1.30	0.60	1.00	0.85	0.40	4.15
Leg formula	4	1	2	3		
	2.9	2.6	2.5	2.1		

The patella of all legs is rather unusually long and its length is purposely given separately.

The spines are slender, few and difficult to see. There is a dorsal distal spine present on the first and second femur. On the tibiae at least of the third and fourth pair one can see 1-1 prolateral, 1-1 retrolateral and 2-2-2 ventral spines. On the metatarsi the arrangement of spines seems to be the same as on the tibiae. At the end of all tarsi is an onychium with three claws (figure 163). They seem to have the same structure on all legs. The upper claws are strongly curved and have three long teeth. The third claw is also strongly curved, but smooth. Serrated bristles are wanting and the hair is only of the simple type and rather sparse.

The petiolus is plainly visible. The abdomen is ellipsoidal, evenly rounded at both ends, 3.05 mm. long to end of spinnerets, 1.35 mm

wide. Neither the epigynal region, nor the tracheal spiracles can be seen. The question as to whether a colulus is present cannot be answered definitely, but seemingly there is none. The median spinnerets cannot be seen, but the upper and lower spinnerets are plainly visible and the former are longer and more slender than the latter (figure 164). The terminal joint of the upper (posterior) spinnerets is long and much as in Agalenidae but has a single, terminal spinning tube (figure 177). The surface of the abdomen is sparsely clothed with simple, short hair.

If the claws were not plainly visible, one could easily mistake this spider for a *Dysdera*, but fortunately the majority of the legs are free from emulsion and their position makes the study under high power simple.

Reimoser lists in his Catalogue twenty-seven Recent palaeartic species of *Harpactes*. A specimen of *H. hombergi* (Scopoli) in my collection has at the end of its posterior spinnerets a single spinning tube, as its fossil relative.

52 Family OONOPIDAE

Genus ORCHESTINA Simon

Type *O. pavesii* Simon

ORCHESTINA BALTICA Petrunkevitch, 1942

This tiny spider is represented in the collection of the Museum of Comparative Zoölogy by thirteen specimens. Eight of these are mature males, one a mature female and the remaining four females of indeterminate age. There are nine specimens in the British Museum. They were described by me in detail and there seems to be nothing new to be added here. The species was undoubtedly quite common and its jumping habits made entanglement in resin simple. In the present palaeartic fauna the genus *Orchestina* is represented by a single species, the genotype, found in Southern France, Corsica, Spain, Alger and Arabia. Four species occur in North America.

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